

Europeana Learning Scenario

(Teachers)

Title

Our Everyday Hardware

Author(s)

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Abstract

The teaching scenario highlights and explains the differences between old computer parts and modern computer parts housed in modern computer cases. Is there a difference in appearance, are they more than 10, 20, or 50 years old? Would you recognize old computer parts? Maybe that depends on how old you are, but you would certainly recognize some if not all.

Exploring the Europeana portal, students will find old computer parts and make a presentation using one of the digital tools offered. Students are divided into three teams and each team is credited with making a presentation of certain old and new parts of the computer. These parts are the mouse, keyboard, processor, motherboard, floppy drive, floppy disks and monitor. Students should compare, explain, and present the differences between old and modern computer parts.

Old electronic parts, old electronic parts... We all face the question of how to deal with old electronic parts. Should we all recycle? What is gained by recycling? Students will present their research work to other teams. Each team will evaluate the work of the other teams. The assessment method will be an MS Forms quiz, a Kahoot quiz and feedback and discussion will be given using an exit ticket.

Keywords

computer specifications, contemporary hardware, IT, old hardware, recycling

Table of summary

<i>Table of summary</i>	
Subject	Informatics
Topic	Computer hardware and recycling
Age of students	10-11
Preparation time	1.5 hours
Teaching time	90 minutes
Online teaching material	<u>Online:</u> 1. Introductory activities:



	<ol style="list-style-type: none"> 1.1. Game - find pairs 1.2. Game - unlock all padlocks 2. Videos <ol style="list-style-type: none"> 2.1. Video with pictures of old computer parts 2.2. Am I old or not? 2.3. Video about electronic waste 3. Work on the presentation (students can choose one of the following tools): <ol style="list-style-type: none"> 3.1. Piktochart, 3.2. Google Slides, 3.3. Office tools (Office365 - Word Online, PowerPoint Online, Sway) 4. Peer evaluation <ol style="list-style-type: none"> 4.1. Team 1 evaluates Team 2 and 3, 4.2. Team 2 evaluates Teams 1 and 3, 4.3. Team 3 evaluates Team 1 and 2. 5. Computer assembly simulation 6. Worksheet of pictures of old and new computer parts 7. Kahoot quiz (it can be played as a guest, no need for login). 8. Self-assessment in MS Forms 9. Exit ticket
Offline teaching material	Workbook (optional), scissors.
Europeana resources used	<ol style="list-style-type: none"> 1. Processor (CPU) 2. Keyboard 3. Floppy Disk <ol style="list-style-type: none"> a) Mini Floppy Disk with case b) Floppy Disk Philips MSX c) Memory Device – Floppy drive 3.5. 4. Monitor 5. Motherboard 6. Mouse

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Integration into the curriculum

From the Croatian national curriculum, 5th grade:

The student explores the main components of common digital systems, determines the basic functions and connections with others, and explores how such systems can be connected to a network and how to exchange data.

The student uses multimedia programs to realize more complex ideas in a communication or collaborative environment.

The student argues and assesses the importance of electronic waste disposal and explains the procedures for its disposal.

Aim of the lesson

Students will be introduced to very old computer parts. They will compare and explain the difference between old and new computer parts. They will see the need for environmental care and recycling. Students will dedicate themselves to research and teamwork.

Outcome of the lesson

Through the work in the presentation, students will make short research, present the research to other students and conclude what the difference between old and modern computer parts is and why it is important to recycle.

Trends

Collaborative Learning: a strong focus on group work,
Peer Learning: students learn from peers and give each other feedback,
Student-centred Learning: students and their needs are at the centre of the learning process,
Visual Search & Learning: images and multimedia are more powerful than verbal stimuli,
Open Source Learning: teachers copy, share, adapt, and reuse free educational materials,
Learning materials: a shift from textbooks to web resources and open source books, and,
BYOD: students bring their own mobile devices to the classroom (if they want to).

Key competences

Literacy competence: understanding, creating and interpreting concepts, facts and opinions in oral and written forms, using visual, sound/audio and digital materials across contexts. Students express the ability to communicate and connect effectively with others, in an appropriate and creative way.

Digital competence: students will understand how digital technologies can support communication, creativity and innovation, and be aware of their opportunities, limitations. Students will understand the general principles, mechanisms and logic underlying evolving digital technologies and know the basic function and use of different devices.

Personal, social and learning to learn competence: students will work with other students in a constructive way, remain resilient. The work is based on collaboration, they learn to be ready to overcome prejudices and make compromises.

Citizenship competence: caring for the environment and humanity - involves critical thinking and integrated problem-solving skills, as well as skills to develop arguments and constructive participation in community activities.

Activities

Name of activity	Procedure	Time
<p>1. Introductory activities</p>	<p>Students are introduced to computer parts by playing a game of matching pairs: https://bit.ly/computerparts10</p> <p>Conversation between teacher and student.</p> <ul style="list-style-type: none"> • Have you ever seen an open computer case? • How many computer parts in the case can you name? • Could you describe what each part of the computer is responsible for? • Do you have an old computer at home? • How should you store it properly if you no longer use it? • How does pollution of the natural environment with e-waste affect humans? <p>A quiz! Students must unlock all padlocks to complete the game. Link: https://bit.ly/scavengerhunt10</p> <p>Correct answers are:</p> <ol style="list-style-type: none"> 1. CPU or Processor, 2. RAM or RAM, 3. ROM or ROM memory, 4. HDD or Hard Disk Drive, 5. SSD or Solid State Drive, 6. Motherboard, 7. Mouse, 8. Recycle or Recycling. 	<p>8 mins</p>
<p>2. Name and explain the computer parts</p>	<p>The teacher shows an open computer case on the projection screen with visible parts of the inside of the case. The projection is displayed during the next activity.</p> <p>Each student receives a worksheet with one part of the computer on it. The worksheet can be downloaded using this link: https://bit.ly/computerpartscutit</p> <p>The teacher places the parts of the computer on the pieces of paper in one box. One by one, the student comes to the box, takes a piece of paper, points his finger at that part of the computer in the open computer case, and says a few sentences about that part of the computer.</p> <p>There are also old parts of the computer on the pieces of paper. The teacher intends to provoke a student's reaction. What will happen when a student takes a piece of paper with an old piece of the computer on it that they have never seen? Well, let's learn something about these <i>old-timers</i>.</p>	<p>7 mins</p>

Name of activity	Procedure	Time
<p>3. Name that old-timer</p>	<p>Let's watch a video with pictures of old computer parts. Some parts of a computer are more than a few decades old. Link: https://www.youtube.com/watch?v=MUeb9WtEyLY</p> <ul style="list-style-type: none"> • What parts of the computer did you recognize? • Do you see similarities with modern computer parts? <div> <p>The image is a screenshot from a video titled "Computer hardware". It displays several vintage computer components arranged on a light background. In the top row, from left to right, there is a processor with a digital display showing "41699", a green motherboard with a blue floppy disk on top, and a black floppy drive. In the middle row, there are two blue floppy disks, a beige keyboard, and a beige mouse. At the bottom, a hand is holding a white marker, with the word "Computer" partially visible on a surface.</p> </div>	<p>5 mins</p>
<p>4. E-waste</p>	<p>Electronic devices permeate all aspects of our lives, from mobile devices to computer devices used in the household, transportation, medicine, learning, etc.</p> <ul style="list-style-type: none"> • What happens to electronic devices if we frequently replace them with others? • Where does such waste accumulate? What do we call such waste? • Are all the old devices and electronic components in museums? <p>Students watch a video about electronic waste. Link: https://www.youtube.com/watch?v=FmJFVmtWf-I (1:52 min).</p>	<p>5 mins</p>

Picture 1. Screenshot from the video called *Computer parts* ([Source](#), Attribution CC BY)

The teacher explains the interconnectedness of all the parts of the computer. We see that in essence, the computer has not changed much. We still use the keyboard and mouse as the main parts for computer input.

Name of activity	Procedure	Time
5. Team formation and task assignments	<p>Students will work in teams. There will be three teams. A team leader is selected. Every team is given an assignment.</p> <p>Team 1 is tasked with making a presentation on modern computer parts and old computer parts. Team 1 will describe the following old computer parts in the presentation: mouse and keyboard.</p> <p>Team 2 is tasked with making a presentation on modern computer parts and old computer parts. Team 2 will describe the following old computer parts in the presentation: processor and motherboard.</p> <p>Team 3 has the task of making a presentation about modern computer parts and old computer parts. Team 3 will describe the following old computer parts in the presentation: floppy disk and monitor.</p> <p>Each team will answer the following questions in their presentation:</p> <ul style="list-style-type: none"> • Are hazardous/toxic substances and chemicals used in the manufacture of electronic devices? • Why shouldn't we throw our electronic devices into the natural environment? • What are the benefits of recycling? • What can you do to reduce the amount of electronic waste? • How does pollution of the natural environment with e-waste affect humans? How are plants, animals and people connected? 	10 mins
6. Europeana search and web search	<p>Students search the Europeana portal. Links are given above, but students can search and explore their own examples of old computer parts on the Europeana portal. Keywords are the following: <i>old computer, old parts, computer, CPU, keyboard, mouse, monitor, motherboard, floppy disk</i>.</p> <p>Students will also collect the following for the presentation:</p> <ol style="list-style-type: none"> a) a picture of the said product, b) in what year the product was made or the range of years in which the product was used, c) what is the difference between this product and the product used today. <p>Students search the internet to find pictures and specifications of modern computer parts.</p> <p>To make students more prepared and confident in solving the following tasks, they watch the following video: https://youtu.be/DQEuqi0oe8</p>	10 mins

Name of activity	Procedure	Time
<p>Old or modern? Take a guess!</p>  <p>Picture 2. Screenshot from the video called <i>Am I old or modern</i> (Source, Attribution CC BY)</p>		
<p>7. Work on the presentation</p>	<p>Students choose which digital tool to use to present their research. Students can use Word Online, PowerPoint Online, Google Slides, Piktochart, Sway... Students make a presentation.</p>	<p>20 mins</p>
<p>8. Teamwork presentation</p>	<p>One team member presents their research using a digital tool. Each team has 5 minutes to present their work.</p>	<p>15 mins</p>
<p>9. Peer evaluation, self-assessment</p>	<p>Each team will evaluate the presented research of other teams using Microsoft Online Word. Results will be published after all the presentations are presented and evaluations have been made. Links to peer evaluation:</p> <p>Team 1 evaluates Team 2 and 3, Team 2 evaluates Teams 1 and 3, Team 3 evaluates Team 1 and 2.</p> <p>The evaluation sheet is located below in the annex in case the evaluation sheets need to be printed.</p> <p>Students perform a self-assessment using MS Forms and Kahoot quiz.</p>	<p>10 mins</p>
<p>10. Additional task (if time remains). Simulation –</p>	<p>Computer assembly activity. Through a computer assembly simulation, students can assemble an entire computer as they would in the real world. Appropriate animations (e.g. opening a RAM holder, etc.) are permeated through the simulation. In this way, students explore the interconnectedness</p>	

Name of activity	Procedure	Time
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Computer assembly

of computer components in an interesting way. The program can be downloaded at the following link: <https://bit.ly/computerassembly>



Picture 3. The screenshot shows some parts of the computer attached to the computer case using a simulation

Assessment

1. Students perform a self-assessment using the [MS Forms quiz](#). Correct answers are marked with a green tick.

1



The picture shows the computer memory / storage that is cleared when the computer is turned off. *

(1 Point)

Yes ✓
 No

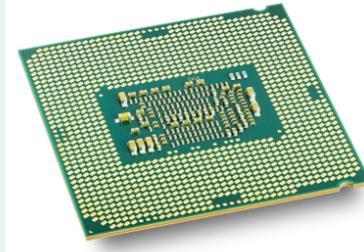
2

High-capacity memory / storage that has mechanical parts and is increasingly falling out of use. *

(1 Point)

- SSD
- HDD ✓
- CD-ROM
- ROM
- RAM

3



What is the name of the part of the computer shown in the picture? *

(1 Point)

- RAM memory
- cooler
- processor ✓
- motherboard

4

It is credited with transmitting the image through it and displaying it on the monitor screen. *

(1 Point)

- motherboard
- network card
- graphic card ✓
- ROM memory

5

Odd one out! *
(1 Point)

- ROM memory
- RAM memory
- motherboard ✓
- SSD
- HDD

6



The picture shows a cooler that serves to cool the processor, ie not to overheat. *
(1 Point)

- No
- Yes ✓

7

The memory / storage that is not cleared when the computer is turned off is called *
(1 Point)

- ROM ✓
- RAM

8

Fast storage for large data storage. No mechanical parts. Permanently stores data. *
(1 Point)

- HDD
- RAM
- CD
- SSD ✓

9

Processor, RAM, SSD or HDD storage constantly *
(1 Point)

- are loud
- are slow
- exchange data ✓

10



The picture shows the old part of the computer. How it's called? *
(1 Point)

- CD-ROM
- Floppy Disk ✓
- SSD

11

The picture shows the old part of the computer. *
(1 Point)



- Yes ✓
- No

2. Students perform a self-assessment using the [Kahoot](#) quiz. Correct answers are marked with a green tick.

<p>1 - Quiz</p> <p>For the natural environment and people, it is best, for example, to have an old mobile phone that is ...</p>	 20 se
<p><input checked="" type="checkbox"/> I give to those who need it</p>	✓
<p><input type="checkbox"/> I throw it in the trash</p>	✗
<p><input type="checkbox"/> I throw it on the street</p>	✗
<p><input type="checkbox"/> I disassemble myself at home and call the garbage collectors</p>	✗
<p>2 - Quiz</p> <p>Electronic devices contain hazardous and toxic substances and must therefore not be disposed of i...</p>	 20 se
<p><input checked="" type="checkbox"/> No</p>	✗
<p><input type="checkbox"/> Yes</p>	✓
<p>3 - Quiz</p> <p>Electronic waste (e-waste) often consists of</p>	 20 sec
<p><input checked="" type="checkbox"/> glass and paper</p>	✗
<p><input type="checkbox"/> cardboard</p>	✗
<p><input type="checkbox"/> plastic, mercury, lead</p>	✓
<p><input type="checkbox"/> fabrics</p>	✗
<p>4 - Quiz</p> <p>If we recycle e-waste, it means that some material from that waste will be used again.</p>	 20 sec
<p><input checked="" type="checkbox"/> Yes</p>	✓
<p><input type="checkbox"/> No</p>	✗
<p><input type="checkbox"/> Yes, but only again for such a device!</p>	✗

5 - Quiz

Proper disposal of e-waste is of great importance for all mankind!

20 sec

Yes ✓

No ✗

***** AFTER IMPLEMENTATION *****

Student feedback

[Exit tickets](#) can help assess the understanding of student activities and help to improve teachers' work. Given questions are:

1. Did you understand today's lesson?
2. What were the main points of today's lesson?

Final thoughts

QUESTION 1
Did you understand today's lesson?



QUESTION 2
What were the main points of today's lesson?

Picture 3. The screenshot shows the questions in the digital version of the exit ticket

Teacher's remarks

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About the Europeana DSI-4 project

[Europeana](#) is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.

[European Schoolnet](#) (EUN) is the network of 32 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.

Annex

The evaluation is conducted by Team 1	
Presentation evaluation criteria for Team 2	Rate it from 1 to 5
Team 2 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	
Team 2 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 2 described what is the difference between old computer parts and the product used today.	
Team 2 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design is well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 2 for overall achievement.	
Presentation evaluation criteria for Team 3	Rate it from 1 to 5
Team 3 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	
Team 3 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 3 described what is the difference between old computer parts and the product used today.	
Team 3 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design are well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 3 for overall achievement.	

Table 1. The evaluation conducted by Team 1
 The printable worksheet is available here: <https://bit.ly/peerhandout3>

The evaluation is conducted by Team 2	
Presentation evaluation criteria for Team 1	Rate it from 1 to 5
Team 1 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	
Team 1 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 1 described what is the difference between old computer parts and the product used today.	
Team 1 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design are well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 1 for overall achievement.	
Presentation evaluation criteria for Team 3	Rate it from 1 to 5
Team 3 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	
Team 3 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 3 described what is the difference between old computer parts and the product used today.	
Team 3 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design are well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 3 for overall achievement.	

Table 2. The evaluation conducted by Team 2
 The printable worksheet is available here: <https://bit.ly/peerhandout2>

The evaluation is conducted by Team 3	
Presentation evaluation criteria for Team 1	Rate it from 1 to 5
Team 1 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	

Team 1 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 1 described what is the difference between old computer parts and the product used today.	
Team 1 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design are well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 1 for overall achievement.	
Presentation evaluation criteria for Team 2	Rate it from 1 to 5
Team 2 covered all the important data about old computer parts from the Europeana portal (a picture of the said product, in what year the product was made or the range of years in which the product was used)?	
Team 2 covered all the important data about present computer parts (important to compare with old computer parts)	
Team 2 described what is the difference between old computer parts and the product used today.	
Team 2 answered all questions about environmental protection and recycling.	
On the visual aspects of the presentation: The layout of the elements and the design are well arranged (the images do not overlap, the contrast does not bother the eyes...).	
Rate Team 2 for overall achievement.	

Table 3. The evaluation conducted by Team 3

The printable worksheet is available here: <https://bit.ly/peerhandout1>