



# SUSTAINABILITY AND DIGITALITY

## Learning and Teaching Package 2

**UNIT 2: MY SMARTPHONE. PLANET EARTH AND ME.**

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## Overview

The LTP introduces the relationship between digitality and sustainability. Knowledge and pedagogical materials on topics such as harmful effects of digital technologies on the environment, the importance of digital technologies to deal with the climate crisis, and the social inequalities and social dependencies arising from digital infrastructures are addressed.

Unit 2 invites to look at the complex relationship of digitality and sustainability through the technology we use on everyday basis. As the title “My Smartphone. Planet Earth and Me” suggests, the focus is first on the phone, then on the whole world and finally on one’s use of technology. The smartphone is our constant companion. But what is a smartphone made of, where do its parts come from and where does a phone end up after its use? The activities in this unit closely follow the life cycle of a smartphone and introduce questions about individual media use in terms of sustainability: What can I do to make my media use more sustainable? What is the average usage time of a smartphone? Would it help if I did not buy a new smartphone every two years? What can I do with my old phone?

## Pedagogical Approach

The activities in Unit 2 provide knowledge based on scientific evidence from an interdisciplinary research perspective. Students are encouraged to reflect on their own role in the field and to experience the topics of digitality, the environment and sustainability in a hands-on way, for example by disassembling real-life digital devices to see what is “inside the box”. The topics and tasks are chosen in such a way that it becomes clear that the aim is to deal with questions about future and alternative forms of action. However, there can never be one right answer. But many questions will be raised. The activities of this unit aim to enhance students’ and school students’ exploratory thinking, exploring and use of various disciplines, using creativity and experimentation. The activities engage students and school students in teamwork and encourage them to take different roles.

The materials aim to give ideas to bring them into teacher education and schools and can be adapted for various contexts and enriched further. The Unit finishes with a [Follow-Up Activity](#) for teachers to reflect on their practice in view of integrating the topic of sustainability into their practice, and includes [TAP-TS Roadmap](#) that can be seen as a visualisation of materials design, and a [Template](#) for developing teaching and learning materials with guiding questions.

## Sustainability and Digitality: Importance of the theme

The aim of this Unit is to provide teachers, student teachers as well as students in schools with food for thought on the use of digital devices which accompany us and our children at almost every moment of our lives. It aims to focus on the benefits and risks of living in the digital age, and to imagine a more sustainable future with technology.

## Piloting of the materials within TAP-TS

The materials of Unit 2 were first presented during Summer School 2023 in Larnaca, Cyprus as one hour and a half workshop for practicing teachers, student teachers and teacher educators. They were further developed and tried out in primary schools in Vienna. The materials are also presented as a Moodle course on TAP-TS Platform - <https://tap-ts.eu/course/view.php?id=12>



## UNIT Overview



Main Topic	Target Group	Duration	Knowledge Area/ Subjects in School	Activities	Possible assessment
Understanding the materiality of digitality, using the example of a smartphone	Pre- and in-service teachers, materials are provided for students in school (adaptable for 6-14y.o.)	Min 180 min; Run as a half-day workshop or project work for a month: 45 mins – 1 hour a week.  Extra time is dedicated to reflections on teacher practice	The materials can be integrated into the curriculum or given as a workshop. Knowledge areas would be: <ul style="list-style-type: none"> <li>✓ (Digital) media education</li> <li>✓ Geography</li> <li>✓ Technics and Arts</li> <li>✓ STEM subjects</li> </ul>	<p><b>Start-Up Activity:</b> The Life Cycle of a Smartphone.</p> <p><b>Development Activity 1:</b> Unblack the Box!</p> <p><b>Activity 2:</b> What's Inside Your Phone?</p> <p><b>Activity 3:</b> Pin the Planet!</p> <p><b>Activity 4:</b> From Trash to Treasure!</p> <p><b>Consolidation Activity 1:</b> My Smartphone and me.</p> <p><b>Activity 2:</b> Phone of the Future</p> <p><b>Follow-Up Activity 1:</b> Reflection for action</p> <p><b>Activity 2:</b> Reflection on teacher Practice</p>	a suggestion for a project work; reflective questions
<b>Intended Learning Outcomes</b>	<p><b>Having worked through the activities and materials, students will be able to:</b></p> <ul style="list-style-type: none"> <li>✓ Reflect on their own media use regarding a more sustainable development.</li> <li>✓ Name individual phone parts and what they are for.</li> <li>✓ Discuss the notion of “conflict materials”.</li> <li>✓ Name precious materials in smartphones and where they come from.</li> <li>✓ Discuss the concept of “upcycling”.</li> <li>✓ Assess their own impact on a more sustainable development in the context of broader social and capitalist developments.</li> </ul>				
<b>Prior Competencies</b>	optional/ideal: Unit 1. Relationship between Digitality and Sustainability				
<b>Required materials</b>	<ul style="list-style-type: none"> <li>• Digital devices no longer in use / discarded smartphones</li> <li>• Various tools or mobile phone repair kit (see iFIXIT, <a href="https://de.ifixit.com">https://de.ifixit.com</a>)</li> <li>• Materials to download - / Downloadable materials and crafts</li> </ul>				
<b>Cooperation/ Networking</b>	<ul style="list-style-type: none"> <li>• Local repair café or mobile phone repair shop</li> <li>• Recycling collection centre</li> <li>• school/college/educational institution (e. g. for collecting mobile phones)</li> <li>• NGOs with mobile phone collection campaign (e. g. Jane Goodall Institute)</li> </ul>				



<b>Practical Notes for Teachers</b>	The timing given at the beginning is meant for orientation. The Unit materials can be used as a monthly project, or one long workshop. Activities can be adjusted to suit the timing of the project or workshop. Most parts of this LTP are designed for teaching the last year of primary level, some parts are rather suitable for teaching at secondary level. One will need to adapt the materials to the age group/ level of class.	
<b>Addressing GreenComp</b>	<b>Embodying sustainability values</b>	
X	1.1 Valuing sustainability	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
X	1.2 Supporting fairness	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	1.3 Promoting nature	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
	<b>Embracing complexity in sustainability</b>	
X	2.1 Systems thinking	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
X	2.2 Critical thinking	To assess information and arguments*, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
	2.3 Problem framing	To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.
	<b>Envisioning sustainable futures</b>	
X	3.1 Futures literacy	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future
X	3.2 Adaptability	To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
	3.3 Exploratory thinking	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
	<b>Acting for sustainability</b>	
	4.1 Political agency	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
X	4.2 Collective action	To act for change in collaboration with others.
	4.3 Individual initiative	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.



## UNIT DESCRIPTION

UNIT DESCRIPTION		Estimated Duration
<b>Start-Up</b>		
<p><i>The aim of the start-up activity is to introduce the topic. Students will reflect on their own media use and analyze the different steps in the life cycle of a mobile phone.</i></p>		<b>20 min</b>
<p><b>Activity 1: The Life Cycle of A Smartphone</b></p> <p>This is a small group activity aimed to raise awareness about the production steps and ways of recycling of a smartphone.</p> <p><b>Green Comp:</b> 1.1. Valuing Sustainability; 3.3 Exploratory thinking</p>	<p><b>Preparation for Activities:</b> Organize your classroom for a group work. Ideally, each group would have access to a <b>computer or tablet, or phone.</b></p> <p><b>Description</b></p> <ol style="list-style-type: none"> <li>1.  Give students time to study <a href="#">the interactive content on the “Life Cycle of a Smartphone”</a>; and answer the questions that follow.</li> <li>2.  Think–Pair–Share: Hand out <a href="#">the worksheet “Life Cycle of a Smartphone”</a> (also, see Handouts LTP2Unit 2 Start-up and Development Worksheets) and ask students to think about each question. Then ask to discuss the questions with a partner or within a small group.</li> </ol>	



Development		Estimated Duration
<p><i>To understand the materiality of digital media, it is worthwhile to understand digital devices in their proverbial components. In this sense, students are guided and encouraged to disassemble an old device (e. g. smartphone, tablet) into its individual parts to see what is “inside the box”. Furthermore, they are introduced to the concept of ‘conflict materials’.</i></p> <p><i>The instructions contain an explanation of the essential steps, tips on the necessary tools as well as didactic instructions in which the deconstruction of digital devices could be integrated in schools and universities. Concrete worksheets are provided for this task and are also freely available as OER (CC license) and as editable PPT presentations. The four activities consist of disassembling phones, matching metals to phone parts, finding countries where precious metals are mined on a map, and the concept of reusing things by making treasures out of trash. If disassembling real phones is not possible, annotated videos are available. Each activity ends with an interactive online task (LearningApp), where students need to collect 4 numbers to open a treasure box, previously prepared by the teacher. This box can be filled with any (un)sweet reward.</i></p>		90 min
<p><b>Activity 1: Unblack the Box</b></p> <p>The emphasis of this exercise is team work on a specific task. In groups, students disassemble an</p>	<p><b>Preparation for Activities:</b> Organize your classroom for group work; groups of around 3-4 students. Students can be asked to take different roles: reading instructions, disassembling a fair phone, assistants.</p> <p><b>Prepare for each table:</b></p> <ul style="list-style-type: none"> <li>• Various screwdrivers or a repair kit for phones (see iFIXIT, <a href="https://de.ifixit.com">https://de.ifixit.com</a>);</li> <li>• Hair dryer;</li> <li>• Discarded smartphones.</li> </ul>	30 min



old smartphone to see what is “inside the box” and which function individual parts have.

**Green Comp:** 1.2







*Supporting fairness;*

*1.3 Promoting nature;*

*3.3 Exploratory thinking;*

**A Note for a Teacher:** The activity involves disassembling real phones, and can be difficult for younger students. If you think this can be too challenging, annotated videos are available.








### Description

1.  Show the [Video on the journey of a conflict-free mineral into Fairphone 2](#). Discuss with the students what struck them most.
2.  Explain that you are going to disassemble phones to see what else is inside the phones, and explore where the materials come from.
3.  Direct students towards [Worksheet WS Unblock the Box \(see in Handouts\)](#).
4.  Ask them to study the instructions, and decide on who is going to take the role of ‘instructors’, ‘disassemblers’, and ‘assistants’. Ask them to check if they have all the necessary tools.
5.  After disassembling a phone, ask students to study the phone parts and try to name them with the help of a worksheet.
6.  Ask students to complete [the LearningApp](#) and find out the first number that they will need to open the treasure box.








### Additional Resources:

- [Fairphone Urban Mining-Miners Guide](#)
- [Keys and Explanation](#)








<p><b>Activity 2: What's Inside Your Phone?</b></p> <p>The emphasis of this activity is to investigate which materials and how many of them make up a phone. Another aim is to question the sustainability of the phone production as it is now, and inquire about more sustainable ways of building phones.</p> <p><b>Green Comp:</b> 1.3 Promoting nature; 3.3 Exploratory thinking</p>	<p><b>Preparation for Activities:</b> Organize your classroom for group work; groups of around 3-4 students. Students can be asked to take different roles.</p> <p><b>A Note for a Teacher:</b> To make the activity more visual, a set of 100 coloured cubes / matches etc. that represent the amount of each material in a phone.</p>	20 min
	<p><b>Description</b></p> <ol style="list-style-type: none"><li>1.  Start by showing <a href="#">the Video on What's inside a smartphone</a>. <i>You can leave the task for the end or watch it at home.</i></li><li>2.  After watching, discuss the environmental and social impact of creating technology.</li><li>3.  Explain that you will work in groups to explore the materials that make up a phone.</li><li>4.  Direct students towards the <a href="#">Worksheet What's Inside Your Phone</a>. Ask them to read the instruction 'What's Inside Your Phone' (WS2.1), and work with the diagram (WS2.2).</li><li>5.  Match the phone parts with the materials (WS 2.3).</li><li>6.  Think-Pair-Share: Go back to WS2.1 and ask the students to discuss the questions in the box (WS2.1).</li><li>7.  Complete the <a href="#">Learning App</a> and get the second lucky number for the treasure box.</li></ol>	









<p><b>Activity 3. Pin the Planet</b></p> <p>The emphasis of this exercise is to investigate where precious materials for phones come from. Another aim is to inquire about the social and environmental aspects of sustainability of technology production through the notion of “conflict minerals”.</p> <p><b>Green Comp:</b> 1.3 Promoting nature; 3.3 Exploratory thinking;</p>	<p><b>Preparation for Activities:</b> you will need a printed world map (A3 format).</p> <p>Organize your classroom for group work; groups of around 3-4 students. Students can be asked to take different roles.</p>	<p>20 min</p>
	<p><b>Description</b></p> <ol style="list-style-type: none"> <li>1.  Start with <a href="#">a Kahoot quiz</a> which helps to reflect on the previous knowledge of the students</li> <li>2.  Hand out the instructions sheet (<a href="#">Worksheet Pin the Planet</a>).</li> <li>3.  Ask the students to cut the pins (WS 3.2) and the countries of origin (WS 3.3) or prepare the materials yourself if the time is limited.</li> <li>4.  Ask the students in groups to decide which country is which and where the materials could come from (relying on their knowledge and intuition).</li> <li>5.  Ask the students to match the pins with the countries of origin following the instruction on the Worksheets WS 3.2 and WS 3.3 (you can choose which of WS3.3 suits your class level better: with or without countries names).</li> <li>6.  Give students WS 3.4 to check their answers and find out more about the materials and countries of origin. You can extend the exercise to a small research on the internet.</li> <li>7.  Complete the <a href="#">Learning App</a>, and get the third lucky number for the treasure box.</li> </ol>	







<p><b>Activity 4. From Trash to Treasure</b></p> <p>A lot of the things we own seems to inevitably end up in the trash. That's kind of a shame because most of these things can be upcycled in tons of fun and creative ways. This, in turn, reduces waste, which is great for the environment. The emphasis of this exercise is to reflect on one's use of devices and engage students / students in thinking about the future and imagining alternatives to e-waste.</p> <p><b>Green Comp:</b> 1.1 Valuing Sustainability; 1.3 Promoting nature; Critical thinking; 2.3 Problem framing;</p>	<p><b>Preparation for Activities:</b> you will need a printed world map (A3 format).</p> <p>Organize your classroom for a group work; groups of around 6 students. Prepare the tables for creative work.</p> <p><b>Description</b></p> <ol style="list-style-type: none"> <li> As an inspiration, show <a href="#">the video on Upcycling</a>, and introduce the concept.</li> <li> Think-Pair-Share: Hand out WS 4.1 and ask the students to look at the pictures, and discuss what they think the things represented are made of. Maybe they know some other examples as well.</li> <li> Ask the students to read about upcycling.</li> <li> You can engage students in a creative task by designing a piece of art of the details of an old phone, paper, pencils etc. Place these inside a picture frame, and present the final products in the classroom or take pictures and display the online.</li> <li> As an additional task, you can ask the students to design a phone of the future considering what they have learned, while thinking of various aspects of sustainable development.</li> <li> Complete <a href="#">Learning App</a>, and get the fourth lucky number to open the treasure box.</li> </ol>	<p>20 min</p>
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Consolidation		Estimated Duration
<p><i>There are two activities to choose from or do both if time allows. The aim of the first activity is to reflect on one’s own use of technology, digital devices individually, in groups and in the classroom. For these a number of reflective questions are provided. The aim of the second activity is to design a sustainable smartphone of the future based on the knowledge and experiences of Unit 2.</i></p>		20 min
<p><b>Activity 1. My Smartphone and Me.</b> The emphasis is on future-oriented reflection, and a small piece of research conducted at home. Students / students are encouraged to create a written or audio (e.g. podcast) reflection on their own media use, media acquisition and media disposal as well as on their experiences with the deconstruction of digital devices. Based on these reflections, a discursive exchange among the</p>	<p><b>Preparation for Activities:</b> Hand out the <a href="#">Worksheet “Starter Discussion”</a> . This will serve as a basis for written or audio reflection.</p> <p><b>A Note for a Teacher:</b> the reflection process can be set as a project work. Action-oriented reflection together with peers and family is the key aim of this task.</p> <p><b>Description</b></p> <ol style="list-style-type: none"> <li> In class: Give individual students the Worksheet “Starter Discussion”, and ask them to complete the table individually first.</li> <li> In class: Ask students to compare their answers in pairs.</li> <li> At home: The questions that follow can be completed at home, as students are asked to inquire about the use of technology at home.</li> <li> At home or in class: Based on these questions, students are asked to reflect on their individual use of phones in writing or recording an audio text. This can be organized in pairs as interviews.</li> <li> In class: ask students to share their reflections.</li> </ol>	



<p>students/ students is guided by moderated questions with a special focus on questions of future developments.</p> <p><b>Green Comp:</b> 1.1 Valuing Sustainability; 1.3 Promoting nature; 3.3 Exploratory thinking; 4.3 Individual initiative.</p>		
<p><b>Activity 2. My Future Phone.</b></p> <p>Based on the acquired knowledge and experience, the emphasis is to reflect and create a more sustainable phone.</p> <p><b>Green Comp:</b> 3.3 Exploratory thinking; 4.3 Individual initiative.</p>	<p><b>Preparation for Activities:</b> you will need the Worksheet “Design the Smartphone of the Future” </p> <p><b>A Note for a Teacher:</b> let your students/students have fun during this activity, and be surprised. You can set the activity as a team work or as a home family project.</p> <p><b>Description</b></p> <ol style="list-style-type: none"> <li>1.  Ask the group first to reflect on the models of their phones. If they are happy with them. Draw the knowledge from Unit 2 to reflect on this question. Let them explore of the phones are easy to repair, what can be their afterlife.</li> <li>2.  Ask students reflect on their use of their phones.</li> <li>3.  Set a creative task to describe the phone of the future. What should it have or not have to help protect the environment?</li> </ol>	




Follow-Up		Estimated Duration
<p><i>The aim of the follow-up activities is to reflect about the teacher practices; and reflect on current and future institutional practices.</i></p> <p><i>In addition, they are called upon to visit regional NGOs with collection campaigns for old digital devices.</i></p>		70 min
<p><b>Activity 1. Reflection for Action</b></p> <p>The emphasis is action-oriented reflection. The students are encouraged to reflect on whether and in what form the deconstruction of digital devices and, optionally, the implementation of repair cafés could be possible and useful in their institutions.</p> <p><b>Green Comp:</b> 2.3 Problem framing; 3.1 Futures literacy; 3.2 Adaptability; 4.2 Collective Action</p>	<p><b>Preparation for Activities:</b> prepare a writing facility to gather reflections collectively.</p> <p><b>Description</b></p> <ul style="list-style-type: none"> <li> Step 1. Reflect on the questions in groups. Gather the reflections.               <ol style="list-style-type: none"> <li>1. What is challenging and what is the problem with using digital devices as we do nowadays?</li> <li>2. What do we expect to happen based on the current use and production of digital devices?</li> <li>3. What constructive actions can we do as a group and myself individually?</li> </ol> </li> <li> Step 2. Explore where you can bring your old devices, and what will be their future.</li> <li> Step 3. Think how your institution can contribute to a more sustainable use of digital devices, and implement some ideas at the insitutional level.</li> </ul>	30 min

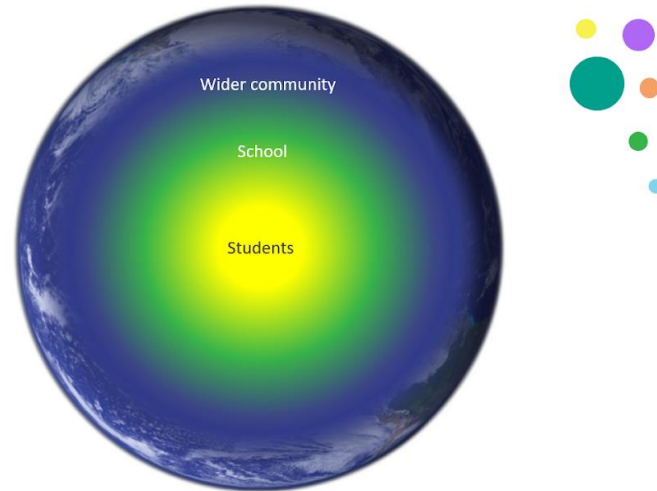


### Activity 3. Reflection on teacher practice

This is an activity aimed at helping reflection (individually and/or with colleagues) on how the previous activities contribute to developing sustainability competences and acting in a more sustainable way.

#### How can I mobilize the activities in my teacher practice?

 Please reflect on two or three of the following dimensions at three levels of engagement (students - teacher; school; and wider community and beyond):




#### Dimension 1. Learning objectives:

- In what ways do these activities contribute to the global educational goals for your students? You might consider in particular LTP methods, materials, tools and activities you would or have implemented/transferred from the TAP-TS LTP into your regular teaching curricula.
  
- Within the school or learning context, how have the activities helped the learners in terms of embodying sustainability values, acting for a sustainable future and/or envisioning a more sustainable future?


40 min





 How have the activities added to the knowledge and understanding of the learners in terms of working with others in the broader community to create inclusive visions for a more sustainable future?



**Dimension 2. Integration with different subjects:**


 In what ways the activities could engage your students with different knowledge areas and subjects of the curriculum? In what ways these activities could be connected with different subjects of the curriculum?


 How have the activities contributed to collaboration with others at school or institutional level to approach a sustainability issue from different perspectives, knowledge areas and contexts?  
In your opinion, do the LTP materials, tools and methods you have implemented also offer potential for use in other subjects? If so, in which subjects?

 How have the activities encouraged students to draw on different perspectives, and subject knowledge to identify interconnections, and reflect on one's own environmental, cultural and economic impact?



**Dimension 3. Inclusion:**

 Can the previous activities contribute to all students' participation and learning? What actions can you take to ensure the learning of all students?

 How have the activities contributed to engage with different perspectives to consider sustainability challenges and opportunities?



How do the activities help reflect on, identify, envision or even shape the trajectory towards a collective preferred future that includes various perspectives, cultures, traditions, and are grounded in values for sustainability?

**Dimension 4. Environmental / Sustainability awareness:**

To what extent do the activities promote awareness and responsibility among your students?

Did the implemented LTP materials, methods or tools increased or rather limited the opportunity to increase students' environmental awareness?

How have the activities encouraged the students to be aware of their individual and collective impact on nature, and provided opportunities to restore it at school level?

How have the activities contributed to grasp connections and interactions between natural events and human actions?



**Dimension 5. Digital resources and equipment:**

Do the current resources and equipment available in your institution adequately support the activities you have selected and implemented from LTP materials, or are there enhancements needed?

How did you try to enable students to use resources for learning at school in a sustainable way?

Did the activities encourage students to assess and question their needs to carefully manage resources in the pursuit of longer-term goals and common interests? How did the activities help them to think critically about information sources and communication channels on sustainability to assess the quality of the information they provide?



**Dimension 6. Community involvement:**

- To what extent can you involve the local community or connect with community issues related to the sustainability theme approached?
- Have the selected and implemented LTP methods, tools and materials encouraged you to initiate cooperation with external partners (associations, companies, NGOs, etc.) to enrich learning experiences? If so, in which areas are you aiming for cooperation?
- To what extent do the activities engage in democratic decision making and civic activities for sustainable development?
- How does your teacher practice encourage students' intentions and willingness to give back to the community and nature?



**Dimension 7. Assessment and feedback :**

- Have you adapted the original assessment methods or the requirements for students after integrating the LTP materials, methods, or tools into your existing teaching concept? If yes, in which way/how?
- To what extent does your teaching practice encourage students to use evidence, combine knowledge and resources to analyse and evaluate futures and their opportunities, limitations and risks, and contribute to decision-making at school level.
- To what extent does your teaching practice encourage students to use evidence, combine knowledge and resources to analyse and evaluate futures and their opportunities, limitations and risks, and contribute to decision-making, and become agents of change.



## Glossary of Icons



- Video



- Quiz



- Worksheets



- Editable Worksheets; task to make notes



- Various Media, e.g. Learning Apps



- Text to Read, or present and actively listen to others



- A question to Respond or a Question for Reflection



- A Discussion



- A task for an inquiry or search



- Focusing Activity



- A Reflection Activity



- An Activity for Action



- Suggested answers



- a short note for a teacher



- a group exchange



## Glossary of Notions

The collaborative writing of a glossary on the central terms of the LTP 2:2 is part of the tasks (create an Glossary).

In the LTP we name:

**Participants** refer to teachers, student teachers, teacher educators.



**Students** refer to school learners.



## Worksheets and Links

### Start-Up

#### Activity 1. Life Cycle of a Smartphone




- **Worksheet**  **Life Cycle of a Smartphone: Worksheet to start the brainstorming activity**
- [The interactive content on the “Life Cycle of a Smartphone”](#) ;

### Development




#### Workshop Activity 1. Unblack the Box

- **Worksheets 1.1 and 1.2**  Unblack the Box: What are the components in your phone?
- Worksheet to edit 
- [Video on the journey of a conflict-free mineral into Fairphone 2](#) .



#### Workshop Activity 2. What’s Inside Your Phone?

- **Worksheets 2.1; 2.2; 2.3; 2.4 with keys**  What’s inside your phone?
- Worksheet to edit 
- [the Video on What’s inside a smartphone](#) .

#### Workshop Activity 3. Pin the Planet

- **Worksheets 3.1 and 3.2**  Pin the Planet: Find the countries of origins of raw materials.
- Worksheet to edit 
- [a Kahoot quiz](#) 

#### Workshop Activity 4. From Trash to Treasure

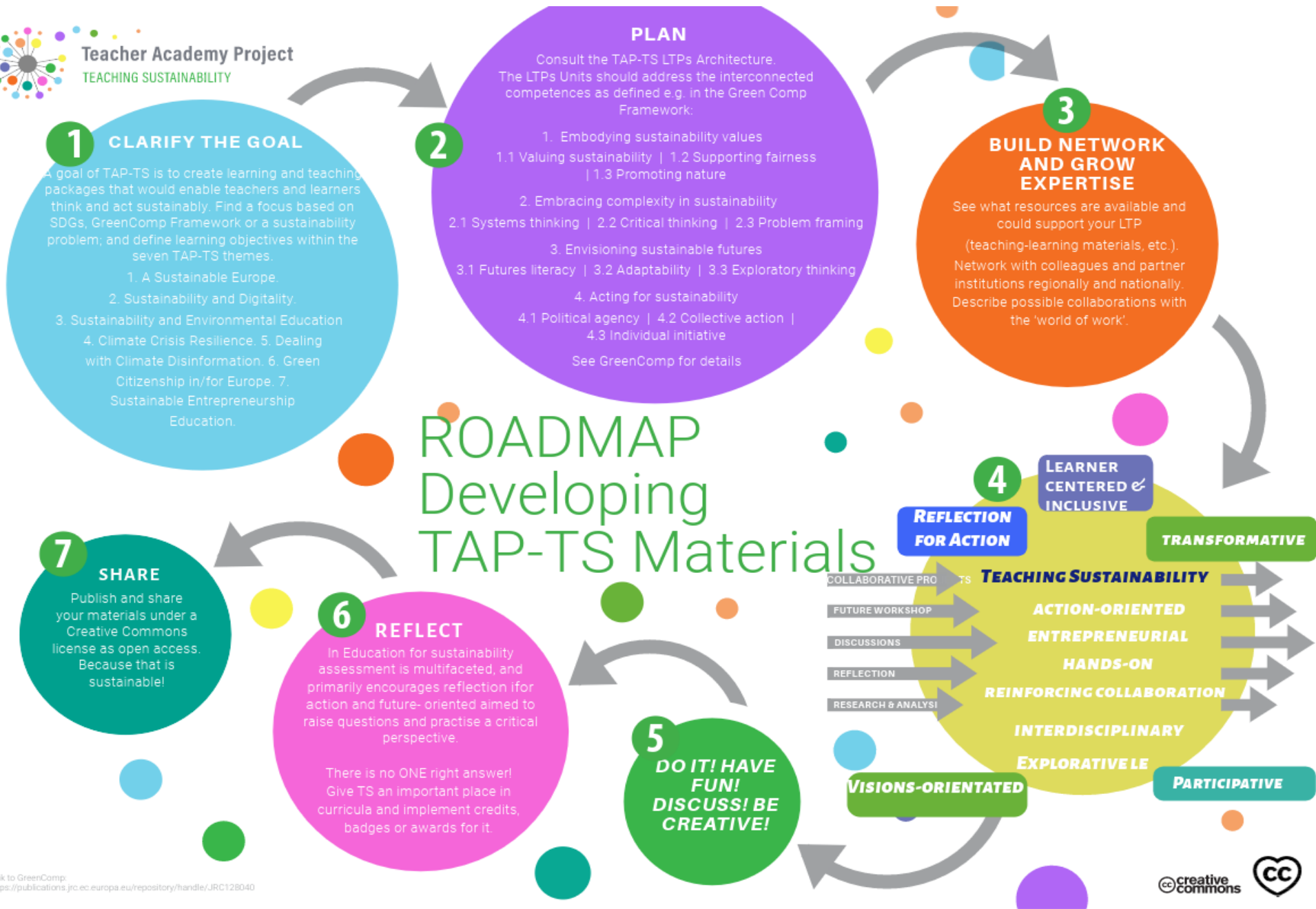
- **Worksheets 4.1 and 4.2**  From Trash to Treasure: Use things you find and turn them into creative treasures
- Worksheet to edit 

## TAP-TS Roadmap

TAP-TS Roadmap has three main goals: (1) for the TAP-TS partners as a roadmap to design LTPs; (2) for teachers and student teachers to design materials for teaching sustainability; (3) evaluation of LTPs. Explore the visualisation on the next page.

### TAP-TS Roadmap: the Steps / stages in the TAP-TS LTPs Design Journey

<b>1: Clarify the Goal</b>	<p>Our overarching goal is to enable learners and teachers to think and act sustainably. To actively participate in the discourse on sustainability, the topics must also be addressed - sustainably - in schools and universities. The goal of TAP-TS is to create learning and teaching packages for this purpose in the following areas:</p> <ul style="list-style-type: none"> <li>2.1 A Sustainable Europe.</li> <li>2.2 Sustainability and Digitality.</li> <li>2.3. Sustainability and Environmental Education.</li> <li>2.4 Climate Crisis Resilience.</li> <li>2.5 Dealing with Climate Disinformation.</li> <li>2.6 Green Citizenship in/for Europe.</li> <li>2.7 Sustainable Entrepreneurship Education.</li> </ul>
<b>2: Competency Areas</b>	<p>The LTPS should be aligned with the interconnected four competences defined in the Green Comp Framework: • Embodying sustainability values • Embracing complexity in sustainability • Envisioning sustainable futures • Acting for sustainability</p>
<b>3: Networking &amp; Bundle Expertise</b>	<p>There are many exciting topics. 1. Find a focus: what driving question is at the centre of your LTP. 2. See what resources are available (competencies, teaching-learning materials, etc.). 3. Network with colleagues and partner institutions regionally and nationally.</p>
<b>4: Working through the design process</b>	<p>Teaching Sustainability should be: action-oriented learning; hands-on; focussing on real life challenges; stimulate creative collaboration between teachers and learners; visions-oriented; participatory and action oriented . Approaches to teaching sustainability may be inquiry-based learning; explorative learning; networked learning; participation learning aimed at problem framing. Teaching Sustainability may incorporate the following activities: collaborative projects, future framing workshops, research and analysis, discussion.</p>
<b>5: ASSESSMENT DESIGN And REFLECTION</b>	<p>In Education for Sustainability assessment can be multifaceted and primarily encourage reflection and be evidence based. There is not always ONE right answer. The goal should be to RAISE QUESTIONS. TS is not about teaching the „right“ behaviour, but about practising a critical perspective. Give TS an important place in curricula and implement credits, badges, or awards for it.</p>
<b>6: PUBLISH TO TAP-TS PLATFORM</b>	<p>Can you and where can you publish your materials under a Creative Commons license as free as possible. Because that is sustainable!</p>





# Teaching Sustainability: Learning activity Template

## 1. Introduce yourself!

<b>My name:</b>
<b>My country:</b>
<b>My role:</b>
<b>My school:</b>
<b>My class:</b>

## 2. OVERVIEW

*Provide a brief description of the learning activity, including information about the targeted age group and duration. Clearly state the motivation behind your learning activity and explain which elements of the curriculum your learning activity is related to.*

**Age Group:**

**Duration:**

**Related Themes of Sustainability:**

**Description:**

## 3. LEARNING OUTCOMES

*What are the learning outcomes of this learning activity, and which key GreenComp competences does it promote?*

## 4. LEARNING APPROACH

*Having in mind the learning outcomes, what active learning approaches will be applied?*

*Specify the engagement strategies and sequence of learning tasks that students will develop in the context of the activity. Explain how GreenComp competences will be promoted.*

*What will be the role of the teacher, and what will be the students' role? How will the students work—individually or in groups?*

## 5. DIGITAL RESOURCES

*Which digital technologies, including tools, services, and resources, will be utilized in the activity? Additionally, how will these digital technologies be effectively integrated to enhance lesson outcomes and student understanding?*

## 6. ASSESSMENT

*What assessment strategies and instruments will be employed to evaluate student learning?*

## GreenComp Framework: the European Sustainability Competence Framework

Within the TAP-TS Project, *GreenComp* (Bianchi et al., 2022) serves the following purposes: design of learning and teaching packages; development of TAP-TS professional development activities, (self)-reflection, and evaluation. The aim of GreenComp is to foster a sustainability mindset by helping teachers and students develop the knowledge, skills and attitudes to think, plan and act with empathy, responsibility, and care for our planet.

### Visual representation of *GreenComp*:



GreenComp consists of 12 competences (in bold) organised into the four areas (in italics) below:

- *Embodying sustainability values, including the competences*
  - **valuing sustainability**
  - **supporting fairness**
  - **promoting nature**
- *Embracing complexity in sustainability, including the competences*
  - **systems thinking**
  - **critical thinking**
  - **problem framing**
- *Envisioning sustainable futures, including the competences*
  - **futures literacy**
  - **adaptability**
  - **exploratory thinking**
- *Acting for sustainability, including the competences*
  - **political agency**
  - **collective action**
  - **individual initiative**

**Reference:** Bianchi, G., Pisiotis, U., Cabrera Giraldez, M. GreenComp – [The European sustainability competence framework](#). Bacigalupo, M., Punie, Y. (editors), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022; ISBN 978-92-76-46485-3, doi:10.2760/13286, JRC128040.

# Project partners



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