Green Digital Teaching Toolkit

Purpose of the Toolkit

The digital toolkit developed as a result of the EcoLeaders project aims to support teachers in developing their eco-leadership skills and to equip them with digital tools and technologies that foster sustainability in teaching practices. The goal is to encourage educators to adopt ecological approaches and critical thinking in order to promote environmental awareness in classrooms. This also involves supporting teachers' ecolinguistic skills, which further strengthens their ability to integrate ecological awareness into education and communication more broadly. Our vision is to develop a broader understanding of the role language plays in shaping ecological consciousness, leading to more sensitive and sustainable communication approaches in schools. In addition, the digital toolkit provides teachers with methods for applying game-based learning and digital tools to engage students in green initiatives and sustainability-focused learning.

The EcoLeaders digital toolkit is inspired by the European Commission's Digital Education Action Plan (2021–2027), which provides a common vision for high-quality, inclusive, and accessible digital education in Europe. The Digital Education Action Plan was developed to respond to the educational needs of European Union countries at a time when, according to research, teachers require more training in the educational use of digital tools and many students still lack basic digital skills (OECD, 2018; ICILS, 2023).

Through the digital toolkit, we aim to encourage teachers to use digital tools and applications effectively in their everyday school practice. Teachers who possess up-to-date digital competences and the ability to apply digital knowledge in teaching are best equipped to teach their students the digital skills required in line with the European Commission's digital objectives.

The EcoLeaders digital toolkit has been developed through international European cooperation, bringing together best practices from schools across different countries. Our vision has been to strengthen partnerships between schools from diverse countries and backgrounds, promoting knowledge exchange and cross-cultural cooperation in green and digital education.

Green education in Europe

The integration of sustainability competences and green education into school curricula is one of the key objectives set by the European Union for education across Europe. A more sustainable and greener future for Europe—and indeed for the entire planet—has become an increasingly urgent global issue, requiring solutions to mitigate the accelerating effects of climate change.

The Intergovernmental Panel on Climate Change (IPCC) projects that, if greenhouse gas emissions continue at current levels, the global average temperature is likely to rise by around 1.5°C between 2030 and 2052. This projection has further increased the focus on the role of education in addressing climate change. In line with this, reports from UNESCO highlight the growing importance of climate literacy, emphasizing that understanding climate-related issues is essential for enabling individuals and communities to take informed action on environmental challenges.

The EcoLeaders digital toolkit aims to provide resources for teaching and addressing climate change as part of everyday school practice.

Often, the teaching of sustainability is left to individual schools or teachers, which limits its broader impact. Research indicates that teachers need more resources and additional training to effectively teach sustainability in schools. Around half of young people feel they receive sufficient education on sustainability at school, and although the majority consider it important, fewer than one third actively engage in sustainable actions in their daily lives (European Commission, 2024). Young people therefore need more meaningful sustainability education in order to develop the knowledge, skills, and motivation to act sustainably in their everyday lives. This may also increase their interest in future careers and job opportunities emerging from the green transition.

Through international collaboration, we have aimed to develop resources that support both digital and sustainability-oriented learning. The toolkit presents affordable educational applications and digital tools that teachers can easily integrate into their teaching. It also includes adaptable lesson plans related to sustainability and climate change. The purpose of these resources is to support digital and green learning in schools across different countries in line with the Sustainable Development Goals.

The European Commission's Digital Education Action Plan (2021–2027) highlights the need to strengthen digital competences as part of the green transition. It encourages education systems to make use of environmentally friendly digital solutions that help lower environmental impacts while also supporting climate-related learning.

The EcoLeaders project is closely aligned with these objectives by promoting green digital skills and supporting teachers in using digital tools in ways that enhance sustainability, reduce the use of resources, and improve climate literacy in classrooms. In addition, the wide availability and accessibility of digital technologies is expected to increase the overall reach and effectiveness of the project.

Findings from the European Schoolnet suggest that the integration of digital tools into teaching can improve student learning outcomes, especially in areas connected to global issues such as climate change.

Sources:

European Schoolnet. (n.d.). *iTEC project: Innovative Technologies for Engaging Classrooms*. https://fcl.eun.org/itec

Intergovernmental Panel on Climate Change (IPCC). (2018). *Global warming of 1.5°C*. https://www.ipcc.ch/sr15/

UNESCO. (2017). *Education for sustainable development goals: Learning objectives*. https://unesdoc.unesco.org/ark:/48223/pf0000247444

European Commission. (2024). *Education and Training Monitor 2024*. Publications Office of the European Union.

OECD (2018): OECD. (2018). *Teaching and Learning International Survey (TALIS) 2018 results*. OECD Publishing.

ICILS (2023): International Association for the Evaluation of Educational Achievement (IEA). (2023). *International Computer and Information Literacy Study (ICILS) 2023 international report*. IEA.

What is the GreenComp framework? Sustainability and digital transformation

Europe's digital transformation is closely linked to the European Green Deal. In the context of the Digital Decade, the EU is addressing two key priorities at the same time: advancing both the green and digital transitions. Digitalisation enables individuals to reduce their personal carbon footprint in everyday life. Even small daily choices can have a significant long-term impact, as these decisions collectively form a person's overall carbon footprint.

Since every individual can contribute to positive change through their own actions and encourage their community toward, for example, sustainability, learning sustainability competences, environmental values, and attitudes in both formal and informal learning contexts is increasingly important as Europeans move forward with the digital and green transitions.

GreenComp is a framework for sustainability competences that establishes a shared foundation for learners and guides educators by clarifying what sustainability competence involves. It supports education and training across lifelong learning and was developed under the European Green Deal to advance sustainability learning across the European Union. In short, the GreenComp framework defines sustainability as prioritising the needs of all life on Earth and the planet itself, while ensuring that human activity remains within planetary boundaries.

The framework also outlines key competences for education programmes, helping learners build the knowledge, skills, and attitudes needed to think, plan, and act as thoughtful and responsible citizens, in a thoughtful and skilled way that supports the environment and public health.

GreenComp defines a sustainability competence as the ability to internalise sustainability values and understand complex systems, enabling learners to act or advocate in ways that support ecosystem health, promote justice, and contribute to sustainable futures. The definition emphasises building sustainability-related knowledge, skills, and attitudes so learners can consider sustainability in how they think, plan, and act, and live in balance with the planet. It recognises that this competence can be developed through formal, non-formal, and informal learning at all stages of life—from early childhood to adulthood—and is relevant in both personal and collective contexts.

At the core of GreenComp are 12 sustainability competences that form the foundation for sustainability skills, divided into four main areas. The first area focuses on embracing sustainability values, including valuing sustainability, supporting fairness, and promoting nature. The second area addresses understanding the

complexity of sustainability, covering systems thinking, critical thinking, and problem framing.

The third area concerns envisioning sustainable futures, such as futures literacy, adaptability, and exploratory thinking. The fourth area highlights acting for sustainability, including political agency, collective action, and individual initiative. (European Commission, GreenComp, 2022)

The Ecoleaders project's digital toolkit has been developed in line with the GreenComp framework's definition of sustainability and its areas of sustainability competences. In our digital toolkit, we have integrated the GreenComp recommendations for teaching and learning about sustainable development. We have taken into account the teaching of sustainability competences defined by GreenComp as part of the resources in the digital toolkit. We particularly highlight values such as the appreciation of sustainability and fairness, as well as critical thinking and understanding the complexity of sustainability.

Sources:

European Commission. (2022). *GreenComp: The European sustainability competence framework*. Publications Office of the European Union.

European Commission. (n.d.). *Green and digital transition*. Digital Strategy. https://digital-strategy.ec.europa.eu/en/policies/green-digital

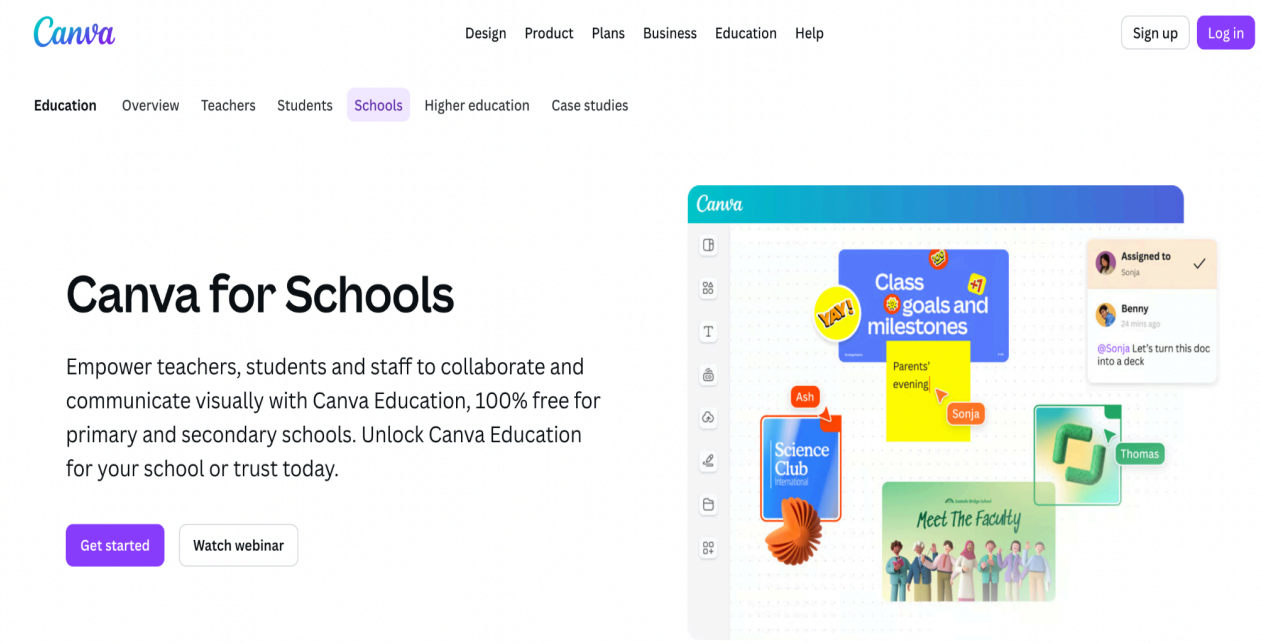
Canva

Canva makes it possible to create visual presentations online, and it is particularly well suited for producing presentations related to environmental topics. It is a free online graphic design tool. The paid version provides access to additional features, but the free version is also highly suitable for creating visual materials.

With Canva, users can design presentations, posters, social media posts, videos, infographics, and much more. Canva's ready-made templates, images, and graphic elements make it easier to create visually appealing presentations. Both teachers and

students can use Canva’s online tools to create presentations. Canva is user-friendly, and presentation templates can easily be downloaded and saved in different formats.

Instructions



Teachers are encouraged to choose the Canva for Education version, which is free for primary and secondary schools. Teachers can share assignments, monitor students’ work in real time, comment on it, and make suggestions for improvement. Teachers can create their own templates, which students can copy individually or work on collaboratively as a group.

Canva for Education is particularly suitable for group work because several students can work on the same project simultaneously, and all changes are visible immediately. Students can create presentations, infographics, written texts, videos, and posters related to environmental themes.

Among the Canva for Education tools, the Whiteboard feature is especially useful for collaborative brainstorming before starting group work. Mind maps, sticky notes, images, arrows, drawing tools, and writing functions enhance collaborative brainstorming activities.

The Docs tool is suitable for writing essays, notes, and presentations. Images and tables can be added to the text, and the text can be transformed into a slideshow presentation with a single click using the Slides feature.

Students can record their own presentations using the Present & Record feature. The tool records audio and, if desired, video as well. The recording can be saved as a link that teachers and classmates can view later.

Canva for Education's Magic Write and AI tools help generate and develop text ideas. Canva's AI features can be used to ask for ideas and explanations, summarise text, and improve text flow. These tools provide useful support for writing, but students should still be encouraged to review and edit the text themselves.

Canva for Education includes all premium features free of charge. It is also free for students when the teacher shares an invitation link, for example via email or WhatsApp.

Creating Canva for Education Access for a School

To create access for your school to Canva for Education, go to canva.com/education and select "Get verified" to apply for Education access. Log in using your school email address, fill in the required information about your school, and complete the verification process. After these steps, you can wait for your information to be approved. Once Canva has verified the information, you will gain access to the Education account.

After activating the Education account, teachers can select the "Classroom" section in Canva and create and name a new class, for example an environmental project. Students can be invited to the project through an email invitation, invitation link, or Google/Microsoft classroom code. Students join the class by clicking the invitation link.

Within the classroom, teachers can share ready-made templates, create assignments, and set deadlines for submitting work.

Suggested Activity

The teacher can ask students to create a group PowerPoint presentation on current environmental topics, such as:

- The importance of recycling
- Tips for saving energy
- Reducing the school's carbon footprint
- The consequences of climate change
- What Earth Hour is and why it is celebrated
- The importance of local food
- Ideas for an ecological school
- The harms and consequences of air pollution

Students should be encouraged to make use of Canva for Education's different features when creating their presentations and to include images and infographics to support their work. The presentation should have a clearly defined length, for example 6–8 slides.

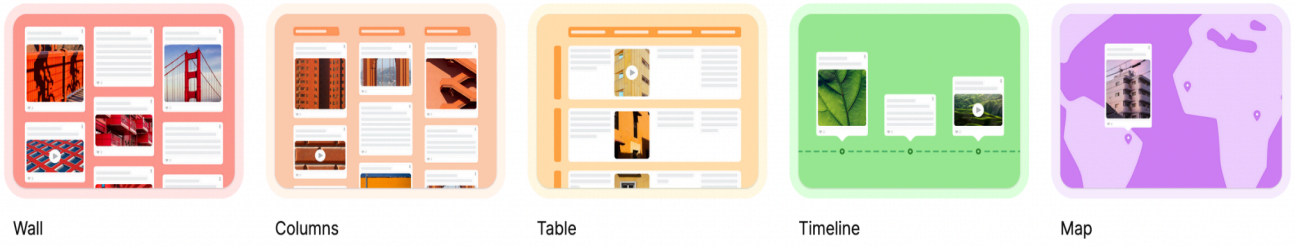
Padlet

Padlet is an online, digital, interactive wall where teachers and students can add content and collaborate on ideas together. Padlet is a modern digital version of a notice board. It is easy to use, and using it for learning does not require advanced digital skills. The free version of Padlet has a limited number of boards, which is important to consider when planning teaching activities.

Using Padlet to support teaching is simple. The teacher creates a wall, or “padlet,” and shares a link or QR code with students. It is an ideal platform for sharing assignments and other educational content.

Padlet can also be used to support distance learning. Students can participate in creating and editing the Padlet using their own devices. It works directly in a browser without installations and is also compatible with mobile devices.

The wall can be used to add text, images, videos, links, audio recordings, files, and drawings. It is a practical platform for collaborative brainstorming, as all participants can create and collect shared content in one place. Padlet is therefore an ideal tool for group work and portfolio-style projects.



How to Get Started with Padlet

Getting started with Padlet is easy. A user account is created at https://padlet.com by selecting “Sign up” in the top right corner of the page. Users can register using an email address, Google account, or Microsoft account.

After logging in, the teacher can create the first Padlet by selecting “Make a Padlet.” Different structures can be chosen depending on the intended purpose. The “Wall” layout is a free-form notice board suitable for collaborative brainstorming. In the “Shelf” layout, content is divided into columns, which works well for group work and step-by-step tasks. The “Timeline” layout allows content to be organised chronologically, while the “Canvas” layout allows content to be connected with arrows and networks in a mind map style.

Next, the teacher names the Padlet and writes a short task description. Clear instructions help students understand the task correctly. The teacher can also adjust students’ permissions in the settings.

If students are assigned the role of readers, they can view the educational content but cannot write or edit it themselves. If they are assigned the role of writers, they can post text and add images and other content, but they usually cannot edit other students’ posts. As moderators, students can approve posts, edit content, and manage discussions. The moderator role is suitable, for example, for a group leader. The admin role is usually managed only by the teacher, as it provides permission to edit the wall, delete content, and change settings.

If the teacher wants to review posts before they are published, content moderation can be enabled in the settings. Teachers can also allow likes, stars, voting, and ratings, which are useful for group work, collaborative brainstorming, and different kinds of voting activities.

Padlets can be shared with students via a link, QR code, Google Classroom, or Microsoft Teams. Students can often access the platform without creating separate accounts. Students add content using the plus button by writing text and adding images, videos, and links. The teacher can monitor students' progress in real time from their own device.

Suggested Activity

Students use their own phones, tablets, or computers during the activity. The teacher creates a Padlet using the Shelf layout to support group work. The teacher creates separate columns for the following ideas:

1. Eco-art
2. Recycling campaign
3. Ecological volunteering day at school
4. School flea market / charity sale

At the beginning of the lesson, the teacher shows images of eco-art, famous recycling campaigns carried out for the benefit of the environment, examples of environmental clean-up activities, or ideas for flea markets and second-hand sales. The teacher then asks students whether they have ever done something to help the environment—for example, created eco-art, participated in an eco-art exhibition or recycling campaign, taken part in volunteering activities, or visited a flea market. Students write their answers on the Padlet.

Next, the teacher divides the students into groups and assigns each group one idea:

1. Eco-art
2. Recycling campaign
3. Ecological volunteering day at school
4. School flea market / charity sale

Each group is asked to come up with five ideas or concrete actions related to their topic. For example, how would they organise an eco-art exhibition or a recycling campaign? What kinds of activities would take place during an ecological volunteering day at school? How would a school flea market be organised?

Students may support their ideas by adding images, links, and videos alongside their written text.

At the end of the activity, groups comment on and vote for the ideas created by the other groups. They discuss what is good about the ideas and what could still be improved. Finally, the class holds a joint discussion about the topics and which ideas could realistically be implemented at school.

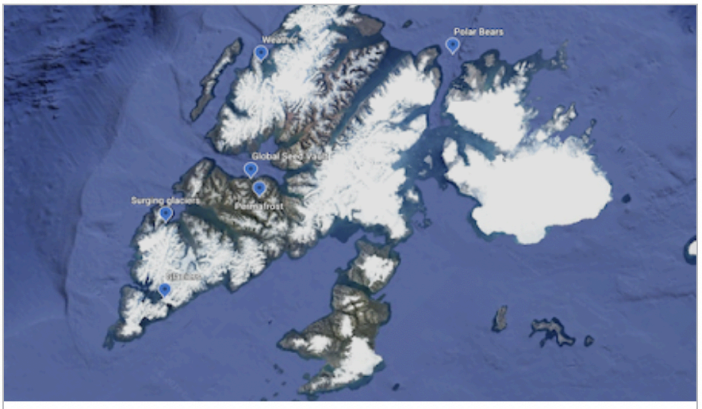
Google Earth, environmental exploration

Google Earth is a free online tool for teaching a variety of environmental topics. It allows students to explore the Earth's geography, biology, and cultures through 3D images, satellite imagery, and historical images. Google Earth is particularly suitable for teaching climate change because it enables users to observe environmental changes. For example, it can illustrate glacier melting and urban growth. In educational use, it is also possible to create projects and measure distances.

Google Earth supports visual, location-based, and interdisciplinary learning. In teaching, it develops students' inquiry-based and phenomenon-based learning skills, which promote media literacy and critical thinking. Students explore different locations and regions through visual content while making observations and comparisons. Google Earth also includes ready-made educational materials and tools to support teaching. The Voyager section offers ready-made educational content and virtual field trips covering topics such as nature conservation and climate change.

The Timelapse feature visualises changes on Earth over time, allowing students to examine phenomena such as deforestation or industrialisation.

Using the measurement tools, students can measure distances between regions and countries, estimate surface areas, and compare different areas with one another.



Creating Stories in Earth

Google Earth's creation tools allow you to create your own projects. Add points, text, and rich multimedia content to share stories and maps visualized on a 3D globe.

GETTING STARTED GUIDE →

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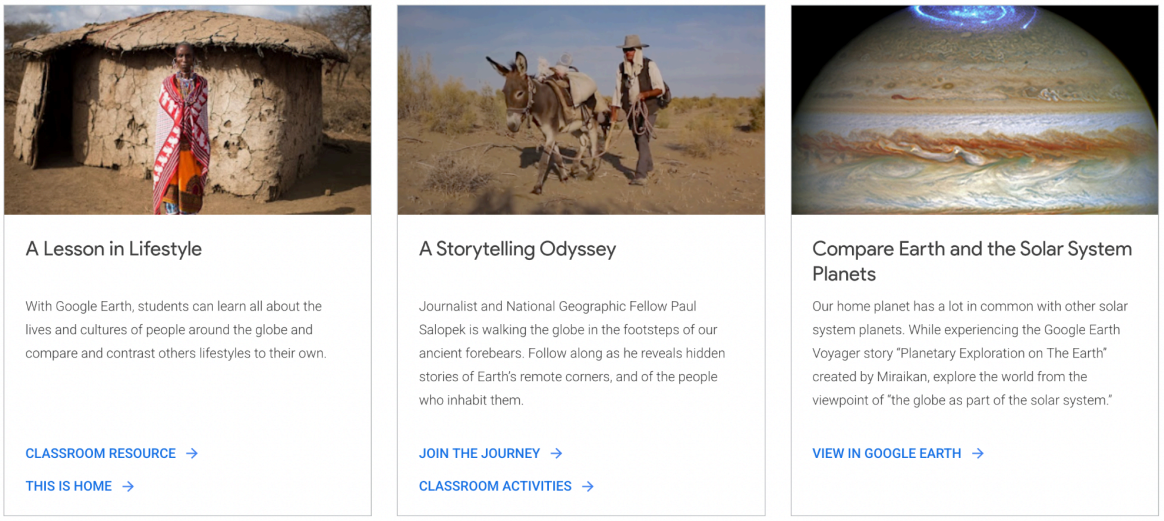
Getting Started with Google Earth for Teachers

Teachers can use the browser-based version of Google Earth. Using the tool does not always require signing in with a Google account. The Chrome and Edge browsers provide the best support for Google Earth.

Teachers can begin exploring the tool by using the search function to find cities, countries, rivers, or even the location of the school. In the Voyager section, teachers can explore ready-made educational materials related to cities, cultural landmarks, nature conservation, and climate change.



In the Projects section, teachers can create and edit their own educational content. Teachers can write instructions, add images and videos, place markers on maps, and create virtual field trips. The Map Style settings help users understand area boundaries, place names, roads, and terrain features.

Using Google Earth largely depends on navigating within the platform, so teachers should familiarise themselves with how to teach students to zoom, rotate the map, and explore 3D and Street View modes. The Timelapse feature also makes it easy to demonstrate changes over time, such as coastline changes or urbanisation.

Suggested Activity

Investigating Climate Change with Google Earth

Required tools: computer/tablet, Google Earth (and optionally Padlet for compiling findings)

The teacher first shows students a Google Earth Timelapse example, such as glacier melting or deforestation. Students comment on the changes they observe and discuss what may have caused them.

Next, the teacher divides students into groups and assigns each group a topic, such as deforestation, glaciers, or urbanisation. Students must locate examples of their assigned phenomenon in Google Earth and identify visible changes. They discuss the causes and consequences of the phenomenon and record their observations.

Finally, each group presents its topic, the observations made, and the consequences the phenomenon may have in relation to climate change.

AI tools, sustainable future scenarios

AI tools (Artificial Intelligence tools) can be used as part of teaching sustainability-related topics. Since schools aim to develop students' sustainability competences so that they can

act responsibly for the environment as they grow into adulthood, it is important to teach them about sustainable future scenarios and how to evaluate them realistically.

Sustainable future scenarios help students understand the environmental impacts of different ways of acting. Positive outcomes resulting from changes in behaviour encourage students to adopt a positive attitude toward actions aimed at protecting the environment and mitigating climate change.

For example, if students construct a future scenario in which consumption continues at its current level, they can calculate how many Earths would actually be needed to sustain human consumption in relation to the planet's carrying capacity. What kind of future can be expected if consumption continues at the same level? What would happen if transport emissions decreased rapidly? How would this affect, for example, air quality or the cleanliness of the oceans?

Students can also evaluate what life in cities might be like in the year 2100, and whether changes are expected in energy sources, food production, or modes of transport in society. What changes are likely to occur, and which of them would be positive? What role does digitalisation play in these changes?

With the help of AI, students can imagine, for example, what Europe might look like in 2100 if it were fully carbon neutral, or what would happen if global emissions were reduced enough to prevent glacier melting. Is it possible to prevent rising temperatures and forest fires in Southern Europe by reducing emissions?

Students can use AI to create two alternative scenarios: one representing a sustainable future and the other an unsustainable future. They can compare the effects of these scenarios in terms of emissions, quality of life, the state of nature, and the role of technology in society.

AI tools help model and visualise future scenarios. Images and infographics of future scenarios help students understand the environmental impacts of different actions, including climate impacts. Students develop critical thinking skills and learn to reflect more broadly on the importance of legislation and political actions in promoting sustainability and protecting the environment.

Using AI Tools to Support Future Scenarios

There are various AI tools that can be used in planning future scenarios. These can be divided into text-based tools, image-generation tools, map-based spatial modification tools, data-based climate simulations, and AI-powered platforms used for presenting results. In this section, we focus on text-based AI, which is the most commonly used form of AI in education.

Text-Based AI Tools

Text-based AI tools help students brainstorm and explain future scenarios in written form. They also provide information to support scenarios and help students gather knowledge

about the topic being studied. ChatGPT (OpenAI) is a popular text-based AI tool that is easy for students to use.

ChatGPT Edu

ChatGPT Edu is a version of ChatGPT designed for educational use, taking into account safer and more privacy-conscious use of artificial intelligence. It offers controlled administration, authentication, and user management features.

If a teacher wants to introduce ChatGPT Edu in a school, the process can begin by visiting openai.com and selecting “Get ChatGPT Edu” or “Contact Sales.” The teacher then fills in the school’s details using the form provided by OpenAI.

During implementation, the educational institution appoints one or more main administrators for ChatGPT Edu. The school may have designated IT staff members for this role, or responsible persons can be assigned separately within the school. The administrator’s task is to deploy the service using the OpenAI administration panel, through which they can manage settings, users, and service usage, and act as the contact person with OpenAI.

The institution’s email domain is verified for user authentication. After verification, users can sign in using their institutional accounts (for example Microsoft 365 or Google accounts) via Single Sign-On (SSO). Necessary user accounts are then created for teachers and students, and appropriate access rights are assigned.

Before using AI in lessons, students should be reminded that AI is a useful tool for searching for new information, but its outputs should not be copied directly without personal reflection. Text-based AI can be used for information retrieval, comparing information, editing texts, and generating ideas, but it is not error-free. Its responses must be evaluated critically and corrected when necessary.