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FITDigit

A Green Future in the Digital World - *FitDIGIT*

(2022-1-HU01-KA220-SCH-000057947)

***Educational materials for teachers and
exemplary lessons for pupils
based on coding***

***Circular economy
in our daily life***

Introduction

“A Green Future in the Digital World” is an Erasmus+ project designed especially to support the innovative digital educational curricula supporting environmental and digital education in schools all around the Europe. Implemented by six partners, it gives strong educational boost to support sustainable green environmental awareness.

One part of the project (WP3) was designed to create interdisciplinary pedagogical model and educational tools to help teachers and their pupils to gain cognitive skills in environmental change with “real life” application. As a result a huge bunch of educational materials has been created, which are divided into two Parts:

Part 1. Digital Stories for Environmental Education

Part 2. E-coding curriculum for Environmental Education

This Handbook is the 3rd element of the second Part of the educational materials, and it provides insightful and innovative information about circular economy in our daily life - what, how, when and the consequences for the environment.

These educational materials are divided into the following parts:

- Theoretical part – presenting theoretical materials on circular economy - for teachers;
- Practical part – examples of programming exercises related to circular economy based on scratch - for pupils;
- The third part presents the lesson plan, and it is supported by
- Quizzes, and
- Exemplary video materials and games to be used during classes.

At the end of the lesson pupils should acquire the knowledge, skills, and competences related to circular economy. They will learn how to apply circular thinking and how to successfully and effectively introduce circular practices into their everyday life.

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THEORETICAL PART



OVERVIEW

What is circular economy?

Circular economy is an economic model designed to minimize waste and make the most of resources. Unlike the traditional linear economy, where products are made, used, and then disposed of, a circular economy emphasizes sustainability by promoting the reuse, repair, and recycling of materials.



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Here are some basics of the circular economy:

1. Principles:

- **Design for Longevity:** Products are designed to have a longer lifespan, be easily repairable, and allow for efficient recycling of materials.
- **Reuse and Repair:** Emphasizes extending the life of products through reuse, repair, and refurbishment rather than discarding them.

2. Lifecycle Thinking:

- **Cradle-to-Cradle Approach:** Considers the entire life cycle of products, from design and production to use, disposal, and potential recycling, aiming for a closed-loop system where materials are continuously regenerated.

3. Waste Reduction:

- **Minimize Waste:** Focuses on reducing waste generation by promoting responsible consumption, recycling, and the use of renewable resources.
- **Zero Waste Goal:** Aims to minimize the amount of waste sent to landfills and incinerators.

4. Resource Efficiency:

- **Optimal Resource Use:** Encourages efficient use of resources, minimizing raw material extraction and promoting sustainable sourcing practices.
- **Industrial Symbiosis:** Promotes collaboration between industries to utilize each other's by-products, creating a more interconnected and resource-efficient system.

5. Product-as-a-Service (PaaS):

- **Shift from Ownership to Usage:** Introduces the concept of offering products as services, such as leasing or sharing, to extend the product life and reduce overall consumption.

6. Innovation and Technology:

- **Advanced Recycling Technologies:** Invests in technologies that enable the efficient recycling and recovery of materials from products at the end of their life.
- **Digitalization:** Uses technologies like the Internet of Things (IoT) to optimize resource use, track product life cycles, and enable smart, connected systems.

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7. **Consumer Awareness:**

- **Education and Engagement:** Aims to raise awareness among consumers about the environmental impact of their choices and promotes responsible and sustainable consumption.

8. **Policy and Regulation:**

- **Government Support:** Encourages supportive policies and regulations at local, national, and international levels to facilitate the transition to a circular economy.

9. **Business Engagement:**

- **Circular Business Models:** Encourages businesses to adopt circular business models that focus on product longevity, recycling, and responsible sourcing.

10. **Global Collaboration:**

- **International Cooperation:** Recognizes the global nature of resource challenges and promotes collaboration among countries, industries, and organizations to create a more circular and sustainable global economy.

The circular economy is seen as a key approach to address environmental challenges, reduce resource depletion, and create a more sustainable and resilient economy for the future.



[Circular Economy](#)

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What is linear economy?

In order to understand the circular economy, it helps to define the linear economy. In a linear economy, which is the traditional model, things follow a straight path: we take resources, make products, use them, and then throw them away as waste. This process often harms the environment and uses up a lot of resources. The focus is mostly on production efficiency, i.e. making things quickly and making money, with little consideration for the long term sustainability of resources and the environmental impacts of waste generation. In summary, the linear economy model is characterized by a "take, make, dispose".

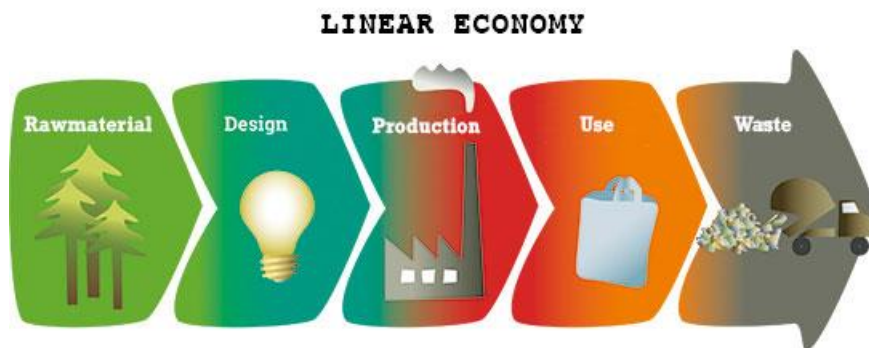


Image by [Naturskyddsforeningen](#)

Basic principles of the linear economy:

1. **Extraction and Production:** Resources are extracted from the environment to produce goods. This involves obtaining raw materials like minerals, fossil fuels, and other natural resources.
2. **Manufacturing and Consumption:** Once extracted, these resources are used to manufacture products that are then consumed by individuals or businesses. The emphasis is on producing as much as possible to meet demand.
3. **Use and Disposal:** Products have a finite lifespan, and after being used by consumers, they are disposed of as waste. This disposal typically involves methods like landfilling or incineration.

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4. **Linear Progression:** The overall process follows a linear path, moving in one direction from resource extraction to disposal. There is little consideration for the end-of-life fate of products, and waste is often seen as a byproduct rather than a valuable resource.
5. **Economic Growth Focus:** The primary goal is often economic growth and efficiency in production. The linear economy model assumes that resources are abundant, and waste management is not a central concern.

Linear economy vs. circular economy



Image by [deceleration.news](https://www.deceleration.news)



[What is the circular economy? | CNBC Explains](#)

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How to bring the circular economy into everyday life

Several examples of the circular economy in everyday life demonstrate the principles of reducing waste, reusing materials, and promoting sustainability:

1. **Reusable Water Bottles:** Instead of using single-use plastic water bottles, people can adopt reusable water bottles made of materials like stainless steel or BPA-free plastics. This reduces the consumption of disposable bottles and decreases plastic waste.
2. **Clothing Swaps and Second-Hand Shopping:** Participating in clothing swaps or buying second-hand clothes promotes the reuse of clothing items. It extends the lifespan of garments, reduces textile waste, and lessens the environmental impact associated with new clothing production.



Image by [flickr](#)

3. **Electronic Device Recycling:** Recycling old electronic devices, such as smartphones, laptops, and tablets, contributes to a circular economy. Valuable materials like metals and plastics can be recovered, and some components can be refurbished or reused, minimizing electronic waste.



Image by [LinkedIn](#)

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4. **Composting:** Instead of throwing organic kitchen waste into the trash, individuals can compost it to create nutrient-rich soil. This closes the loop on food waste, turning it into a valuable resource for gardening and agriculture.



Image by [The Idea Garden](#)

5. **Upcycling Furniture:** Rather than discarding old furniture, people can upcycle or repurpose it. This involves creatively transforming or refurbishing furniture items, giving them a new life and reducing the need for new furniture production.



Image by [Freepik](#)

6. **Car Sharing and Ride-Sharing:** Sharing rides or using car-sharing services reduces the overall number of vehicles on the road, promoting more efficient use of resources. It minimizes the demand for new car production and lowers the environmental impact associated with manufacturing and disposal.

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7. **Community Recycling Programs:** Participating in local recycling programs ensures that materials like paper, glass, and plastic are recycled properly. This contributes to the circular economy by keeping these materials in circulation for as long as possible.
8. **Refillable Containers:** Choosing products with refillable containers, such as shampoo, soap, or cleaning supplies, helps reduce single-use packaging waste. Consumers can refill the containers, extending their lifespan and reducing the demand for new packaging.



Image by [Freepik](#)

9. **Eco-friendly Cosmetics and Cleaning Products:** Refillable containers are an excellent idea but why not take it to the next level? When choosing a product, pick those which are made from biodegradable materials. Even better, you could switch to homemade cosmetics and cleaners because they offer a more sustainable and responsible alternative to traditional products, benefiting both individuals and the planet by reducing environmental impact, promoting health, and supporting ethical and sustainable practices.
10. **Eat Local Food:** eating local benefits the environment by reducing the environmental impact of food production and transportation. It also offers individual and community advantages, including fresher and more nutritious food, a stronger connection to the community, and the preservation of local cultures and economies.



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11. **Food Waste Reduction:** Planning meals, buying only what is needed, and using leftovers creatively can help reduce food waste. Additionally, composting food scraps contributes to the circular economy by converting waste into a valuable resource for soil health.
12. **Repairing Electronics and Appliances:** Instead of discarding malfunctioning electronics or appliances, consider repairing them. Repair cafes and services that fix broken items help extend the life of products and reduce electronic waste.



Image by [Freepik](#)

13. **Buying Responsibly:** Instead of poor-quality items that break quickly and often need to be replaced or discarded, consider buying high-quality products that last longer and are more durable.
14. **Grow Your Food:** Utilize disused spaces for growing your own food. Rooftops, walls can be used in this way. It's also a good idea to join a community garden.



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15. **Rainwater Harvesting:** Rainwater can be collected from off of a roof and can be stored for reuse. It is also possible to collect rainwater on a balcony by leaving a few jugs or pails out during the rain. It will only collect a small amount but still enough to water plants on the balcony or indoor plants.



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16. **Plant Trees:** Trees help to combat climate change and absorb pollutant gases. They also help reduce stress and improve our mental wellbeing.
17. **The Right Form of Packaging:** Make sure that the packaging on the products you buy is 100% recyclable or reusable packaging. When buying fruits or vegetables, the best way is to buy products with no packaging at all. Bring your own reusable bags for your groceries.
18. **Take Your Own Cup:** You can take your own cup to many coffee shops. Buy your coffee where it is possible.



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19. **Borrow, Don't Buy:** Visit your local library if you want to read a book. Borrow a tool or gadget you need from a friend or neighbour.



Image by [Freepik](#)

20. **Smart Meters:** Smart homes including smart meters and connected appliances can help reduce energy consumption and reduce cost.
21. **Less Paper:** Save on paper and ink, go for digital content as much as possible. Avoid excessive printing, subscribe to online magazines instead of their printed counterpart, ask for digital bills, ask for a digital invoice/receipt, etc. A lot of paper is still sent to landfills instead of being recycled. Less paper means many trees, and more money, saved.



Image by [Freepik](#)

22. **Zero Waste Lifestyle:** If you managed to follow all of the above recommendations and more, you could successfully achieve a zero waste lifestyle, the aim of which is to reduce the amount of material you throw away to the minimum.

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Circular Economy in Schools

Education, sensitization and raising awareness is crucial to achieve a shift in the mindset of society. Circular economy education and training should start from an early age. Kids can grasp the principles of circularity and develop a mindset that values waste reduction, recycling, and sustainable practices. Education in schools can influence the behaviour of future generations.



Image by [Freepik](#)

By teaching the principles of a circular economy, students are more likely to adopt sustainable habits in their daily lives. What is more, implementing circular economy education ensures that sustainable practices become ingrained in the mindset of future decision-makers, policymakers, and business leaders. Students who learn about circular economy principles may bring this knowledge into their careers, promoting sustainability in various industries.

Circular economy education:

- ❖ encourages interdisciplinary learning, integrating concepts from science, economics, environmental studies, and design. This holistic approach helps students understand the complexity of sustainability issues and find comprehensive solutions.
- ❖ fosters creativity and innovation by challenging students to think critically about resource use and waste. It may inspire entrepreneurial ventures focused on sustainable products, services, and business models.
- ❖ promotes a sense of global citizenship by highlighting the interconnectedness of environmental, social, and economic systems. Students are encouraged to consider the broader impact of their choices on a global scale.
- ❖ equips students to contribute to solutions for a more sustainable future.
- ❖ prepares students to become advocates for sustainable policies. They can contribute to shaping public opinion and influencing decision-makers to implement measures that support a circular economy at both local and global levels.

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Tips for schools to actively involve students, staff and local communities

Implementing a circular economy in schools involves integrating sustainable practices and principles into various aspects of the school environment. By incorporating the practices below, schools can contribute to creating a more sustainable and environmentally conscious community while educating students about the importance of responsible resource management.

Here are some ways schools can embrace a circular economy:

1. Waste Reduction and Recycling Programs:

- Establish comprehensive recycling programs for paper, plastic, glass, and other materials commonly used in schools. Place clearly marked recycling bins in classrooms and common areas.
- Collect used paper for recycling, emphasizing the importance of reducing paper waste and saving trees.
- Educate students and staff about the importance of recycling and proper waste disposal. Empower students to take leadership roles in managing recycling programs. They can be responsible for collecting and emptying recycling bins, as well as educating their peers about proper waste disposal.

2. Composting:

- Introduce composting systems for organic waste from school cafeterias and classrooms. Use the compost generated to enrich school gardens or local community projects.

3. Sustainable School Uniforms:

- Implement a uniform exchange program where students can donate or exchange gently used uniforms. This promotes the reuse of clothing and reduces the demand for new items.

4. Swap shops:

- Organize regular events where students could bring along items such as gently used clothes, shoes, toys and books that they no longer need and swap them for something that they do.

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5. Sustainable Procurement:

- Choose environmentally friendly and sustainable products when purchasing supplies and materials, such as recycled paper, non-toxic paints, and biodegradable or reusable materials. This encourages sustainable practices in creative projects.
- Encourage suppliers to minimize packaging and provide products with extended lifespans.

6. Repair and Reuse Initiatives:

- Organize repair workshops where students can learn basic repair skills for items like electronics, clothing, and furniture.
- Encourage the reuse of items such as textbooks, uniforms, and school supplies.

7. Circular Design Thinking Projects:

- Integrate circular economy principles into classroom projects and assignments. For example, in science class, students can explore the life cycle of products and materials, while in economics, they can learn about sustainable business practices.
- Challenge students to find innovative solutions to reduce waste and improve sustainability within the school.

8. Energy Efficiency:

- Implement energy-saving measures such as using energy-efficient lighting and appliances.
- Educate students about the importance of energy conservation and its impact on the environment.

9. Green Infrastructure:

- Create green spaces within the school environment, such as gardens and green roofs, to promote biodiversity and improve air quality.
- Incorporate small indoor plants or classroom gardens to improve air quality and connect students with nature. Teach them about the importance of plants in the ecosystem and caring for green spaces.
- Incorporate rainwater harvesting systems to conserve water resources. Rainwater is more suitable for plants than tap water. Encourage students to nourish indoor and outdoor plants with rainwater.

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10. Educational Programs:

- Integrate sustainability and circular economy concepts into the curriculum across different subjects.
- Host workshops, seminars, and events to raise awareness and promote eco-friendly behaviours among students, staff, and parents.

11. Community Engagement:

- Collaborate with local communities, businesses, and organizations to promote a circular economy beyond the school walls.
- Involve parents and community members in sustainability initiatives and projects. E.g. Organize occasional community cleanup projects involving students, teachers, and parents. This not only contributes to waste reduction but also fosters a sense of community responsibility.

12. Monitoring and Evaluation:

- Regularly assess the impact of circular economy initiatives within the school.
- Collect data on waste reduction, energy consumption, and other relevant metrics to track progress over time.

13. Textbook Swap Programs:

- Create a program where students can exchange or donate textbooks at the end of the school year. This reduces the demand for new textbooks and promotes the reuse of educational materials.

14. E-waste Collection Drives:

- Organize periodic e-waste collection drives where students and staff can bring in old electronics such as broken calculators, outdated computers, or used batteries. Partner with local e-waste recycling facilities to ensure proper disposal and recycling of electronic waste.

15. Sustainable Events and Celebrations:

- When organizing school events, consider using sustainable practices. For instance, use digital invitations instead of paper, provide reusable or compostable tableware, and minimize decorations that generate waste.

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16. Student Green Ambassadors:

- Establish a group of student "Green Ambassadors" who take on the responsibility of promoting sustainable practices within the school. They can conduct awareness campaigns, lead environmental projects, and encourage their peers to adopt eco-friendly habits.

17. Outdoor Learning Spaces with Recycled Materials:

- Create outdoor learning spaces using recycled materials. For example, benches made from reclaimed wood or tires, and outdoor chalkboards made from repurposed materials. This not only supports a circular economy but also enhances the connection between students and the environment.

18. Zero-Waste Classroom Challenges:

- Initiate a zero-waste classroom challenge where each class strives to generate minimal waste during a set period. Encourage students to bring reusable containers, use both sides of paper, and find creative ways to repurpose materials. Recognize and reward classes that successfully reduce their waste footprint.

19. Biodegradable and Plant-Based Cafeteria Utensils:

- Transition to biodegradable and plant-based utensils and plates in the school cafeteria. This reduces the reliance on single-use plastics and encourages the use of materials that break down naturally, contributing to a circular approach in waste management.

20. Recycled Art Projects:

- Integrate recycled materials into art projects. Challenge students to create artwork using items like discarded newspapers, cardboard, or plastic bottles. This not only promotes creativity but also instills an understanding of the value of repurposing materials.

21. Bicycle Parking and Repair Stations:

- Install bicycle parking stations at the school to encourage students and staff to bike to school, promoting sustainable transportation. Additionally, set up a bicycle repair station where students can learn basic bike maintenance skills and repair or refurbish old bikes, extending their lifespan.

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Tips for schools on how to implement circular economy principles during school trips



Implementing circular economy principles during school trips is an excellent way to extend sustainable practices beyond the school campus and teach students about responsible and eco-friendly behaviours.

Image by frimufilms on [Freepik](#)

Here are some ideas for incorporating circular economy behaviour on school trips:

1. Zero-Waste Packing:

- Encourage students and staff to pack reusable items, such as water bottles, lunch containers, and cutlery, to minimize single-use plastics.
- Provide information on local recycling facilities and waste disposal practices at the destination.

2. Sustainable Transportation:

- Choose eco-friendly transportation options, such as buses with lower emissions or electric vehicles, to reduce the carbon footprint of the trip.
- Explore public transportation options where feasible.

3. Nature-Friendly Activities:

- Plan activities that promote an appreciation for nature and environmental conservation.
- Organize clean-up activities or nature walks to instil a sense of responsibility for the environment. Organize a friendly competition among students to see who can collect the most litter in a designated area during the trip. Provide small rewards or recognition for their efforts.

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4. Support Local and Sustainable Businesses:

- Choose accommodations and dining options that follow sustainable practices, such as sourcing local and organic produce. Choose restaurants or eateries that prioritize local, seasonal, and sustainably sourced ingredients.
- Encourage students to try regional specialties to support local economies.
- Prioritize businesses that prioritize waste reduction and recycling.

5. Minimal Impact Camping:

- If the trip involves camping, promote leave-no-trace principles by minimizing waste generation and respecting the natural environment.
- Use durable, reusable camping equipment instead of disposable items.

6. Local Farm Visits:

- Plan visits to local farms that practice sustainable and organic farming methods.
- Engage students in farm-to-table experiences, where they learn about the journey of food from the source to their plates.

7. Upcycling Workshops:

- Organize upcycling workshops during the trip, where students can repurpose materials or create art from items that might otherwise be discarded.

8. Beach Cleanup:

- If the trip involves a coastal area, organize a beach cleanup activity to raise awareness about plastic pollution and marine conservation.
- Provide students with reusable bags for collecting litter.

9. Local Artisan Markets:

- Visit local artisan markets where students can learn about traditional crafts and support local artisans who create products with sustainability in mind.

10. Green Energy Tours:

- Include visits to places that showcase renewable energy technologies, such as solar or wind farms.
- Educate students on the importance of transitioning to clean energy sources.

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11. Waste Sorting and Recycling:

- Set up waste sorting stations during the trip to encourage proper disposal of recyclables, compostable materials, and non-recyclables.
- Educate students on the local waste management system and encourage them to participate actively.

12. Community Gardens Participation:

- Collaborate with local community gardens and involve students in hands-on activities, such as planting or harvesting.
- Emphasize the importance of urban agriculture and community involvement.

13. Community Engagement:

- Collaborate with local communities to learn about their environmental initiatives and involve students in community projects.
- Foster connections with local schools or organizations working towards sustainable practices.

14. Post-Trip Reflection:

- Conduct post-trip discussions or projects where students reflect on their experiences and the impact of their behaviour on the environment.
- Encourage them to share insights and suggestions for improving future trips.

15. Document and Share:

- Create a documentary, blog, or social media posts to showcase the school's commitment to circular economy behaviour during trips.
- Assign students the task of documenting the trip through storytelling, photography, or videography, emphasizing the importance of sustainable practices.
- Share the media content with the school community to inspire others to adopt circular economy behaviours.

By integrating circular economy principles into school trips, students not only enjoy enriching experiences but also develop a deeper understanding of their role in fostering environmental sustainability. These practices instil lifelong habits that contribute to a more sustainable and responsible society.

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Schools around the world promoting circular economy principles

There may not be many entirely "green" elementary and secondary schools globally, but numerous schools incorporate environmentally friendly practices and sustainability initiatives. Schools may adopt green practices in their construction, energy usage, waste management, and curriculum to instill environmental awareness in students. These examples showcase the diversity of approaches to sustainability in elementary and secondary education.

❖ [Green School Bali, Indonesia:](#)

- Green School has locations in Bali, New Zealand, South Africa and is working to open a branch in Tulum, Mexico. Green School is renowned for its commitment to sustainability and environmental education.
- Green school's mission is to educate for sustainability through community-integrated, entrepreneurial learning, in wall-less and nature-immersed environment. The campus in Bali is constructed primarily from bamboo and other sustainable materials, and it incorporates renewable energy sources.
- The curriculum emphasizes environmental stewardship, permaculture, and holistic education.



[Green School Bali: School of the Future, Now](#)

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❖ **H-FARM International School, Italy:**

- H-FARM International School is a day & boarding school offering three IB programmes located 10 minutes away from Venice, Italy. It empowers students to be internationally-minded citizens who are able to shape their own future. They operate on a 51-hectare campus and have a strong focus on digital technology, creativity, sustainability and entrepreneurship.
- It was recognised as the winner of the "Best of Green Schools" category by the Green Schools National Network and the Center for Green Schools of the U.S. Green Building Council in 2023.



[Welcome to H-FARM Campus](#)

❖ **Pan-American School, Costa Rica**

- The Pan-American School is the leading English-Spanish bilingual school in Central America with a unique focus on service and global sustainability. They received a 5 star Blue Flag Certification from the Ministry of Education as a leading Eco-School.
- The school has a bottom-up approach to student engagement and project-based learning.

❖ **The Nature Preschool at Irvine Nature Center** in Maryland, USA:

- The Nature Preschool at Irvine Nature Center is an outdoor preschool that teaches children about the environment through hands-on activities such as gardening, hiking, and bird-watching.
- The preschool also encourages children to explore nature and develop a sense of wonder and respect for the natural world.

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❖ **Singapore American School, Singapore:**

- The Singapore American School has implemented various eco-friendly initiatives.
- The school focuses on waste reduction, energy conservation, and environmental education for students.
- SAS is proud to be a leader among international schools in environmental sustainability practices and strive to involve students in being good stewards of the environment.

❖ **Uaso Nyiro Primary School in Kenya**

- The Waterbank School building at Uaso Nyiro Primary School in Kenya's Central Highlands was named The Greenest School on Earth by the US Green Building Council in 2018.
- It is a simply-constructed, low-tech building. Built by hand in four months, the school is naturally lit and ventilated, consumes no energy and cost less than \$60,000.
- It educates 350 students, grows its fresh food resources sustainably, supplies water to the 700-strong school community and carries out training programs covering animal conservation, beehive and honey conservation, community agriculture, reforestation and fuel conservation cooking.

❖ **Terra Moyo International School, Kenya**

- Terra Moyo International School is a forest school in Nairobi, and it was awarded the Global Eco School's Green Flag in recognition of their efforts in creating a greener and more sustainable world in 2023.
- Their aim is not to create harm and prevent disrupting their natural environment through their interactions with it. Their mission is to include eco-friendly practices in their everyday life from serving local an organic food at every mealtime, through planting trees regularly in the Karura forest to using recycled art materials.



Image on <https://www.terramoyo.com/>

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❖ **The Green Free School, Copenhagen**

- The Green Free School has 200 pupils aged six to 15 puts sustainable living at the heart of its syllabus. It is a private school that has to follow the national curriculum, but at the same time, it is also permitted to design its own syllabus. As a result, students learn subjects like urban farming and greenwashing. They also spend a lot of time outdoors gaining hands-on experience growing vegetables, while learning about edible plants and climatic conditions.
- The school's main building is made entirely of sustainable materials. It houses a workshop where pupils can learn how to sew and work with a lot of natural materials. They also learn to compost, repair bicycles, and collect rainwater.

❖ **Greenwich Academy in Connecticut, USA**

- Greenwich Academy is an independent all-girls school located in Connecticut, USA.
- The school has implemented a number of sustainability initiatives aimed at reducing its carbon footprint. There are solar panels and LED lighting throughout the campus, they compost food waste and use environmentally friendly cleaning products. Many of these initiatives are formulated by the Green Team, which is a monthly gathering of like-minded eco-conscious parents, staff, and upper school students.
- Students maintain a pollinator as well as a vegetable garden, they are often involved in recycling programs and clean-up campaigns, and take part in frequent field trips to study nature.

❖ **Punahou School, Hawaii**

- The school is educating children from ages 4 to 18 and aims to form its students into socially responsible and engaged citizens. The school has invested great funds into sustainable energy and water consumption, tackling food and resource waste, using natural lighting and improving air quality. The aim is to [go net zero](#) by 2025 in a way not to impact the surrounding area.



Image from [YouTube](#)

- Alongside a commitment to an energy-efficient, environmentally friendly campus, Punahou is committed to making sustainability a [learning experience for students](#).

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Sources:

1. <https://www.dssmith.com/sustainability/circular-economy/learn-about-the-circular-economy/what-you-can-do-to-support-the-circular-economy>
2. <https://chat.openai.com/c/ebdb026c-4555-4829-89b8-1627c6a684c4>
3. https://www.ucl.ac.uk/bartlett/planning/sites/bartlett/files/the_circular_economy_of_everyday_life_-_becky_mumford.pdf
4. <https://www.mohawkcollege.ca/about/news/blogs/how-to-collect-rainwater-for-your-plants>
5. <https://circularandco.com/circular-knowledge-hub/interested-in-a-more-circular-lifestyle-weve-got-some-ideas-for-you>
6. <https://www.nytimes.com/wirecutter/blog/repair-cafes/>
7. <https://flippingbook.com/blog/marketing-tips/printing-vs-going-digital>
8. <https://sustainablereview.com/15-easy-ways-to-start-living-a-zero-waste-lifestyle/>
9. <https://chat.openai.com/c/25e5ad99-d31d-4765-8b56-2895bfabd120>
10. <https://www.healthline.com/nutrition/why-eat-local-food#5.-Eating-local-supports-your-regional-economy>
11. <https://chat.openai.com/c/cc06a5af-4010-423e-8525-9b55f2d9004f>
12. <https://circularclassroom.com/>
13. [Teaching circular economy](#)
14. <https://chat.openai.com/c/399a2592-1290-474d-9f79-c2069f2e7afd>
15. <https://www.tombag.com.au/post/sustainable-schools>

Useful videos:

1. [Ellen MacArthur Foundation videos](#)
2. [Meet 8 Young Founders Turning Trash Into Cash | World Wide Waste | Insider Business](#)
3. [A World Without Waste: Circular Economy | Climate For Change: Closing The Loop | Ep 2/2](#)
4. [Rethinking The World's Waste: Circular Economy | Climate For Change: Closing The Loop | Ep ½](#)
5. [10 promising ideas to reuse packaging | Circular economy examples Sustainability](#)
6. [Applying circular economy principles to daily life is easier than we might think](#)
7. [Circular Economy in Schools - CEIC Case Study](#)
8. [The Most Eco-Friendly Schools | Green Schools Around the World](#)



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FitDIGIT (2022-1-HU01-KA220-SCH-000057947)

PRACTICAL PART

Scratch coding exercises for pupils



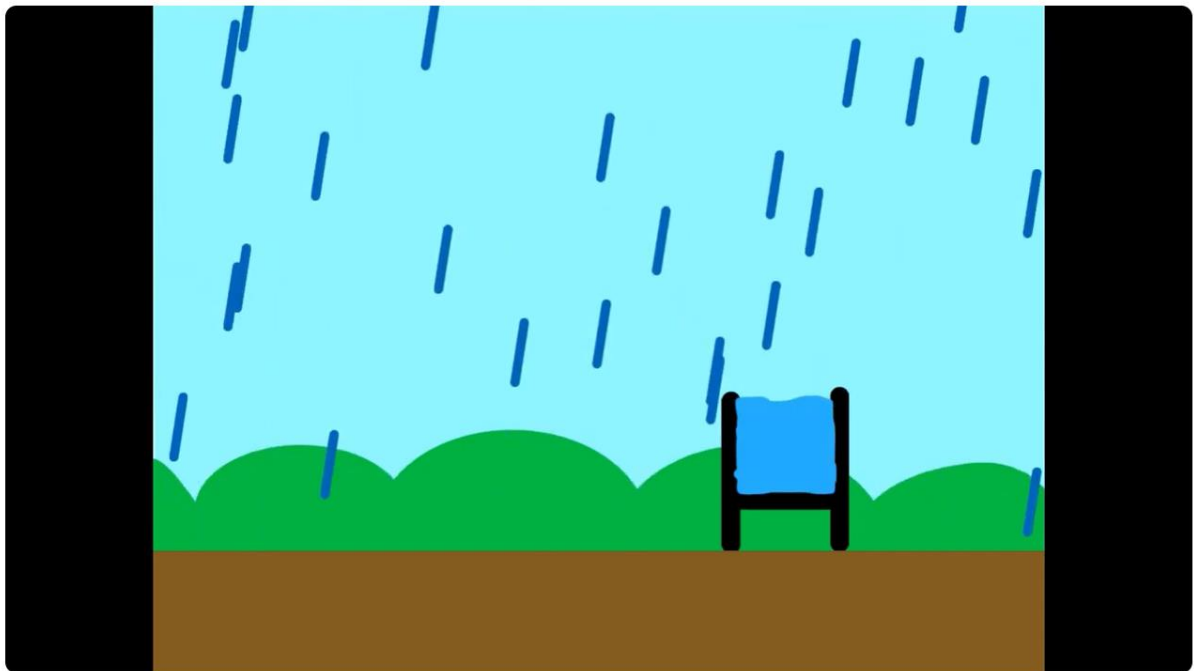
Scratch exercises

Scratch coding exercises by SZISZKI students:

1. Rainwater harvesting

This video and Scratch coding exercise emphasises that harvesting rainwater is good for the planet.

https://scratch.mit.edu/projects/952874341?fbclid=IwAR23_1oAOkuEpCIMPYfTAKgDS2pHwAKHedVograry0XFcIncSuKJm4Jfo38



https://www.youtube.com/watch?v=dniYxED_Yro

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The rain:

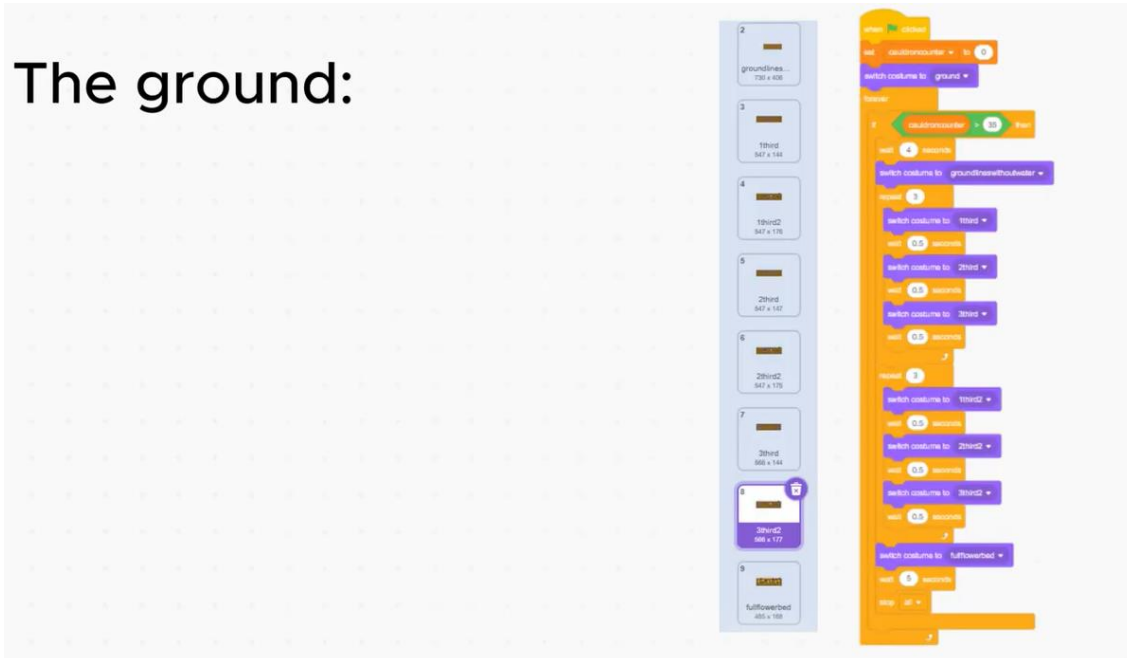
The image shows two Scratch code snippets and a sprite. The first snippet, titled 'when clicked', contains a 'hide' block, a 'repeat until' loop with the condition 'cauldroncounter = 35', a 'create clone of myself' block, and a 'wait 0.01 seconds' block. The second snippet, titled 'when I start as a clone', contains a 'go to x: pick random -240 to 240 y: 250' block, a 'show' block, a 'forever' loop with a 'change y by -5' block, an 'if touching cauldrons?' block with a 'change cauldroncounter by 1' and 'delete this clone' block, an 'if touching groundSprite2?' block with a 'delete this clone' block, and an 'if cauldroncounter = 35?' block with a 'stop other scripts in sprite' block. To the left of the code is a purple sprite named 'Sprite1' with a blue vertical bar.

The cauldron:

The image shows three costume options for a cauldron and a Scratch code snippet. The costumes are: 1. 'empty' (69 x 90) with a white cauldron; 2. 'half' (69 x 90) with a blue cauldron half-filled with water; 3. 'full' (69 x 90) with a blue cauldron full of water. The code snippet, titled 'when clicked', contains a 'show' block, a 'forever' loop with an 'if cauldroncounter < 12?' block and a 'switch costume to empty' block, an 'else' block with an 'if cauldroncounter > 11 and cauldroncounter < 20?' block and a 'switch costume to half' block, another 'else' block with a 'switch costume to full' block, and an 'if cauldroncounter = 35?' block with a 'wait 3 seconds' and 'hide' block.

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The ground:



2. The Danger of Chemicals

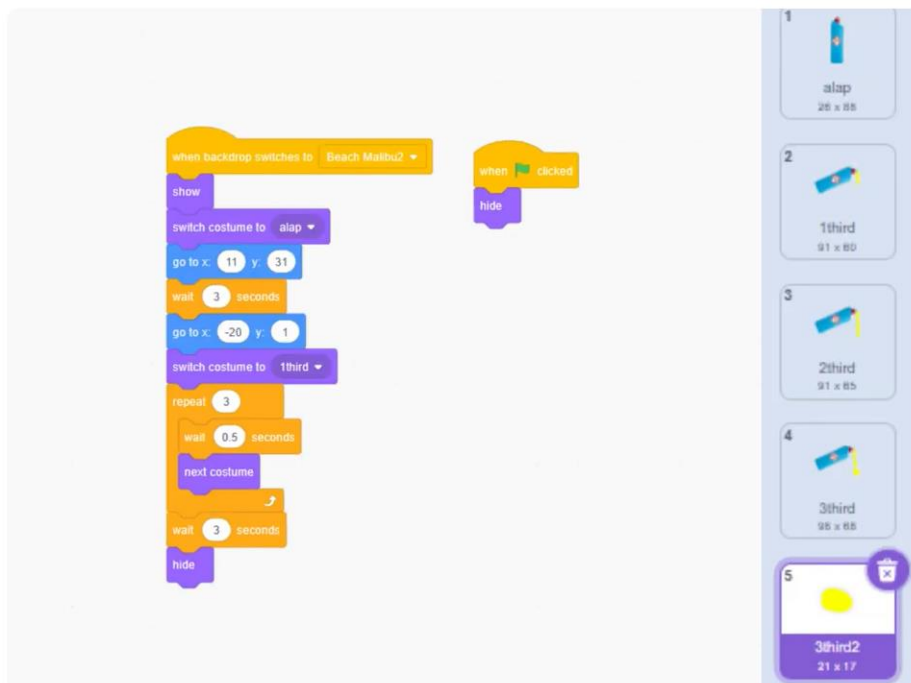
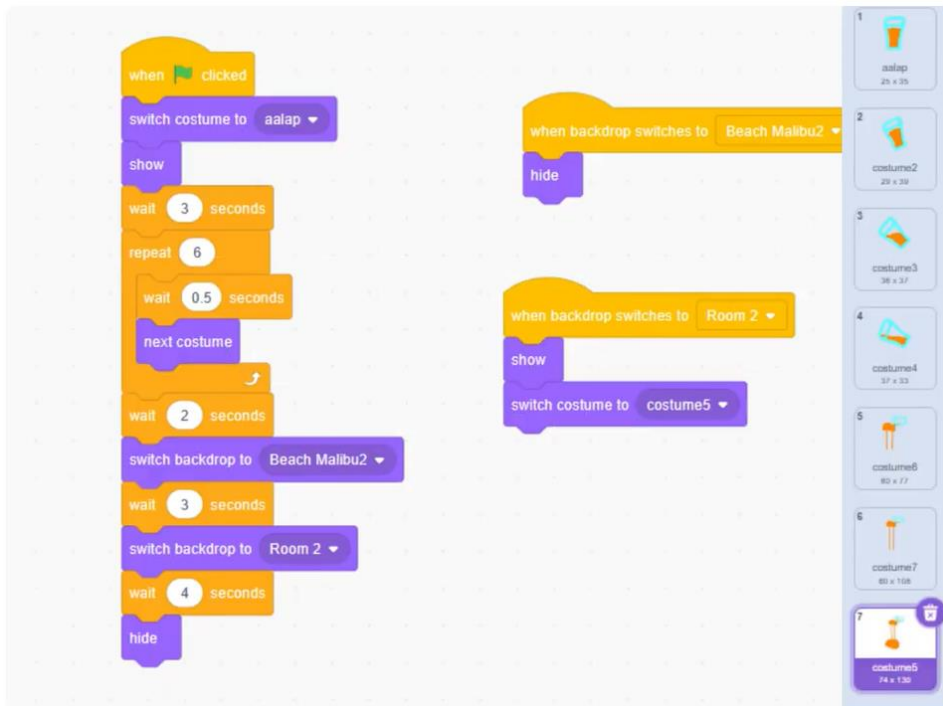
This video is based on the idea that using environmentally friendly cleaning products should be used instead of cleaning chemicals.

https://scratch.mit.edu/projects/952927161?fbclid=IwAR05VdibYNNJque78zPycqP_VVxIR2tR9AwCnqdZxP6vuN83YuXwolHca0

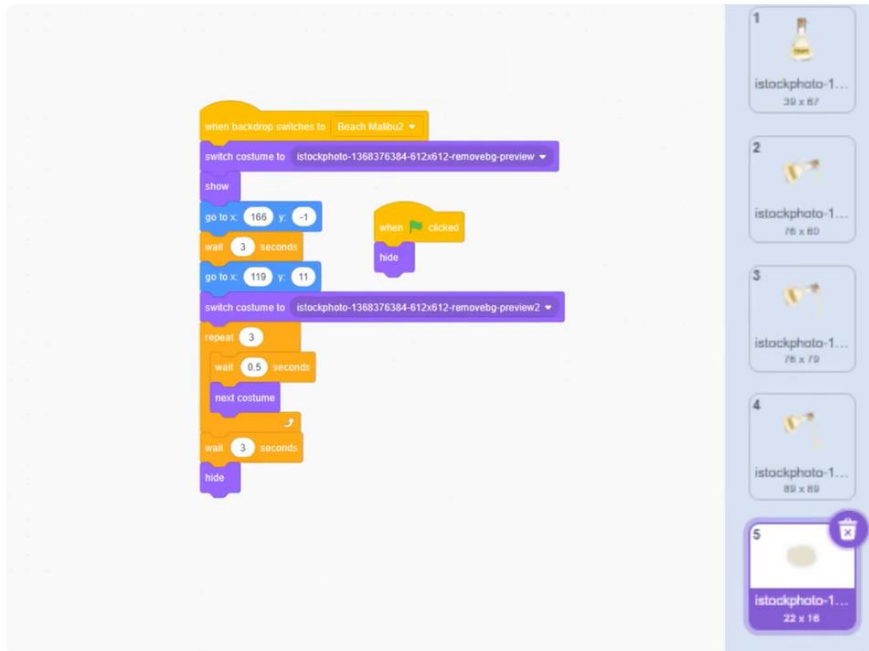


<https://www.youtube.com/watch?v=ZZnlaPtdlWE>

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3. Don't burn plastic

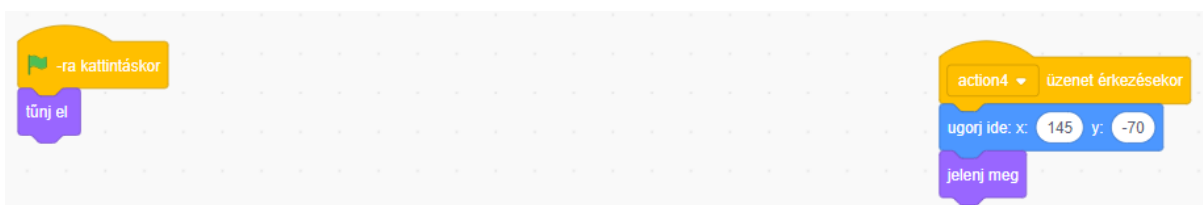
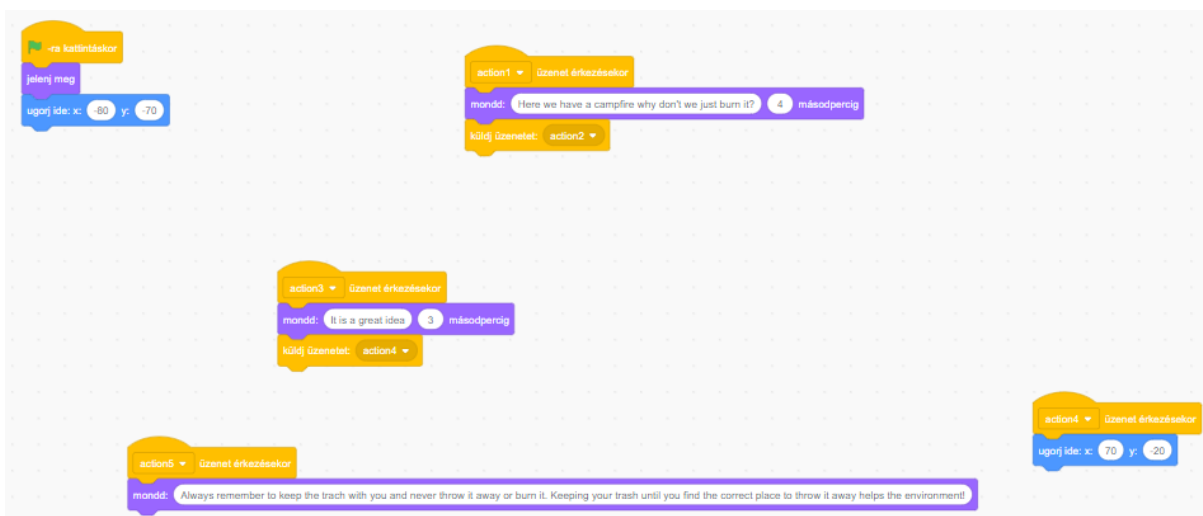
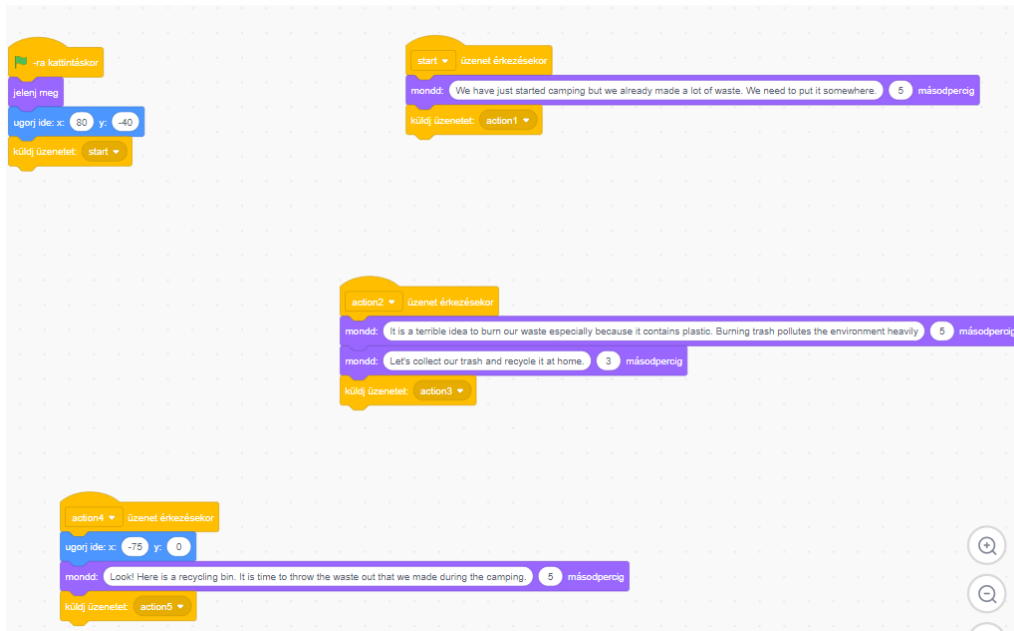
This video calls the attention to recycling instead of burning plastic waste.

<https://scratch.mit.edu/projects/937733547/editor/>



<https://www.youtube.com/watch?v=e1op7PxbwFo>

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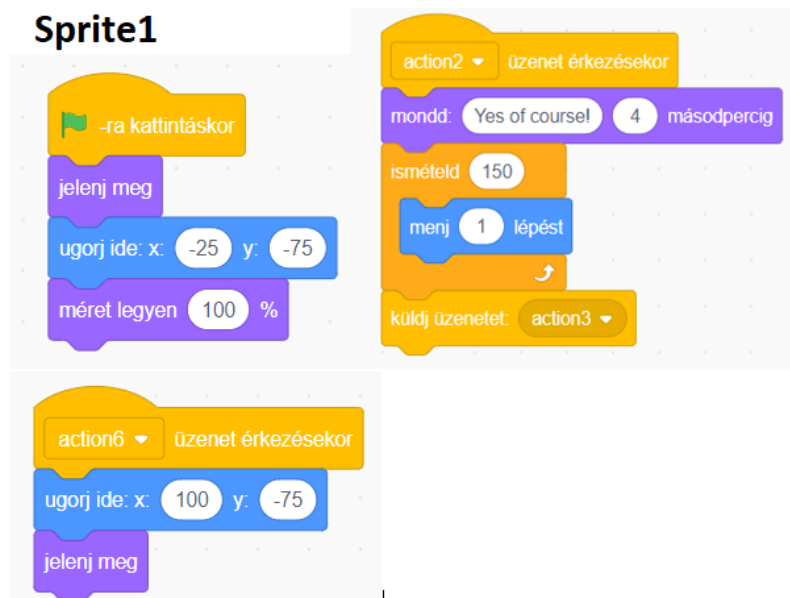
4. The importance of composting

This exercise teaches kids how to make a Scratch program with the topic of composting.

<https://scratch.mit.edu/projects/937717416/editor/>



<https://www.youtube.com/watch?v=ADqJehhYz68>



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The image shows a Scratch script for a character named 'ra kattintáskor'. The script starts with a 'start' event listener for 'üzenet érkezésekor' (message received). It contains a 'mondj' (say) block with the text 'Well done! We finished cooking. Can you get rid of the waste and the leftovers?' for 8 seconds. This is followed by a 'küldj üzenetet' (send message) block to 'action2'. The script then moves to 'action3', which has another 'üzenet érkezésekor' event listener. It says 'Wait! Don't throw everything in the bin, we have a composter remember?' for 8 seconds, then sends a message to 'action4'. Next is 'action6', which says 'Here we go! Throw the waste into the composter.' for 5 seconds and sends a message to 'action7'. Finally, 'action5' has an 'ismételd' (repeat) block for 75 times, containing a 'menj' (go to) block to 'lépést' (step) and a 'tűnj el' (hide) block, followed by sending a message to 'action6'.

The image shows a Scratch script for a character named 'ra kattintáskor'. It starts with a 'jelenj meg' (show) block, followed by a 'ugorj ide: x: 200 y: -130' (go to) block. The script then moves to 'action6', which has an 'üzenet érkezésekor' (message received) event listener and a 'tűnj el' (hide) block.

The image shows a Scratch script for a character named 'ra kattintáskor'. It starts with a 'tűnj el' (hide) block, followed by a 'ugorj ide: x: 0 y: 0' (go to) block, and then a 'jelenj meg' (show) block. The script then moves to 'action6', which has an 'üzenet érkezésekor' (message received) event listener, a 'ugorj ide: x: 0 y: 0' (go to) block, and a 'jelenj meg' (show) block.

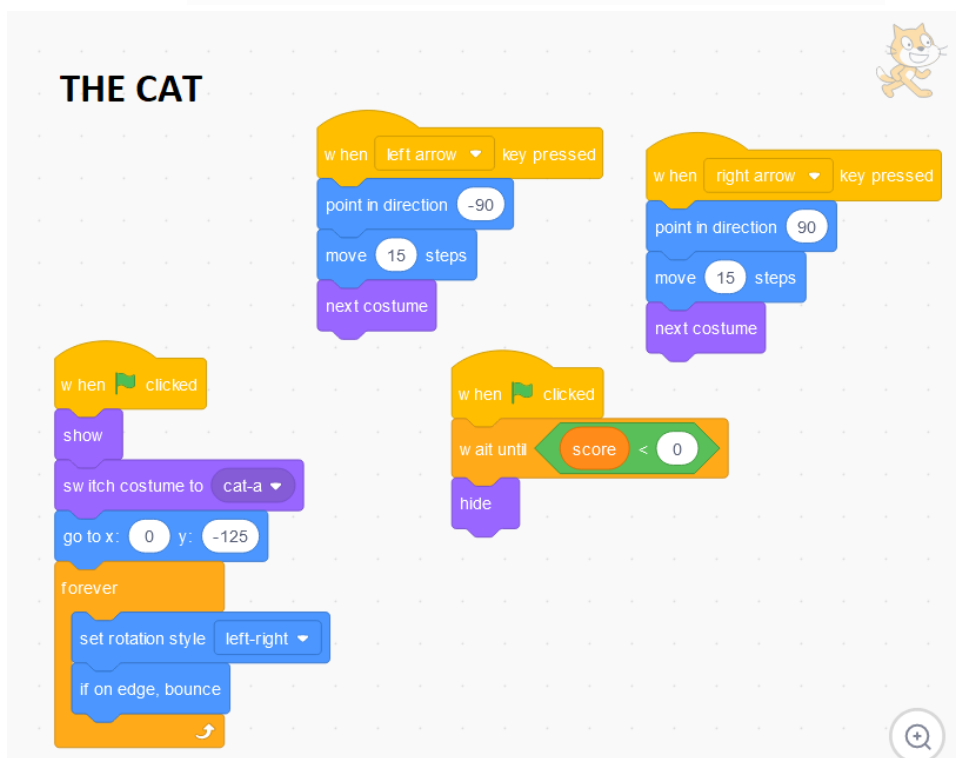
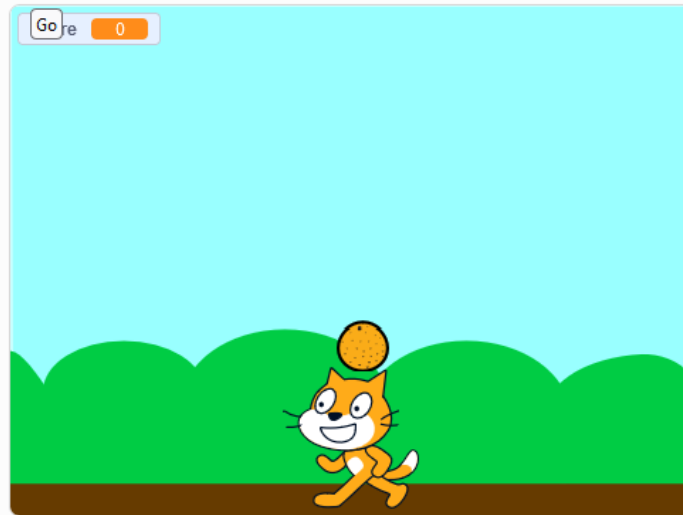
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5. Don't throw organic waste away!

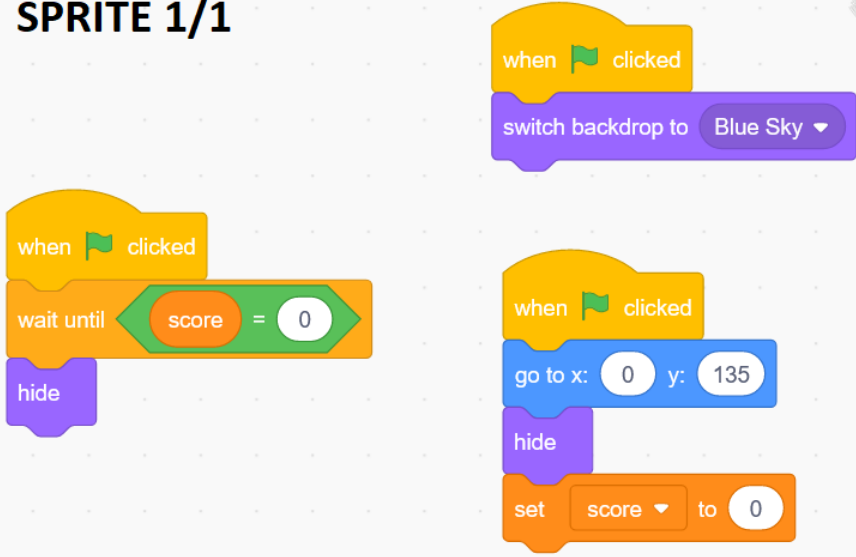
A very simple exercise teaches children how to code a catch game in Scratch.

<https://scratch.mit.edu/projects/936112633/>



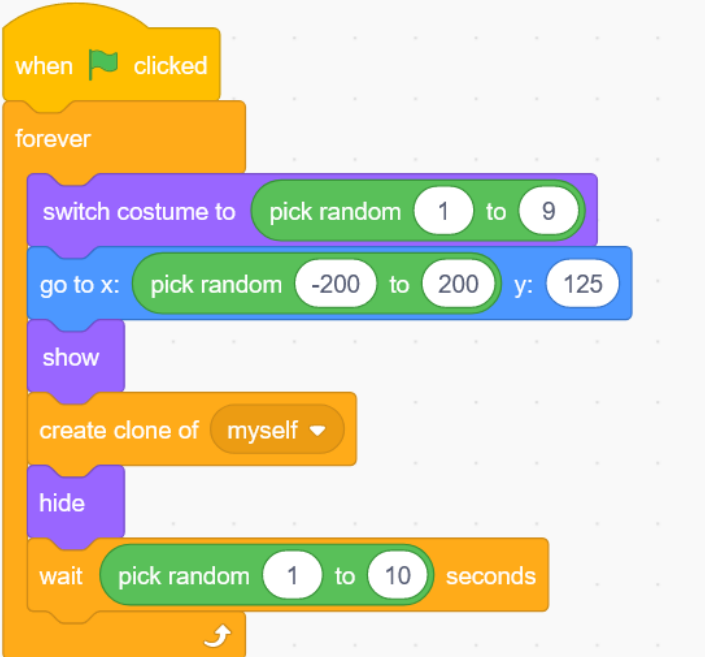


SPRITE 1/1



The image shows two Scratch code snippets for a sprite named 'SPRITE 1/1'. The first snippet consists of three blocks: a yellow 'when green flag clicked' block, a green 'wait until' block with a condition 'score = 0', and a purple 'hide' block. The second snippet consists of four blocks: a yellow 'when green flag clicked' block, a blue 'go to x: 0 y: 135' block, a purple 'hide' block, and an orange 'set score to 0' block.

SPRITE 1/2



The image shows a Scratch code snippet for a sprite named 'SPRITE 1/2'. The code starts with a yellow 'when green flag clicked' block, followed by an orange 'forever' loop. Inside the loop, there are five blocks: a purple 'switch costume to' block with 'pick random 1 to 9', a blue 'go to x: pick random -200 to 200 y: 125' block, a purple 'show' block, an orange 'create clone of myself' block, a purple 'hide' block, and an orange 'wait pick random 1 to 10 seconds' block. The loop ends with a curved arrow pointing back to the start.

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SPRITE 1/3

```
when I start as a clone
  forever
    change y by -5
    if touching Cat ? then
      change score by 1
      delete this clone
    else
      if touching edge ? then
        change score by -5
        delete this clone
```

SPRITE 2

GAME OVER

```
when clicked
  hide
  wait until score < 0
  switch backdrop to backdrop1
  show
  stop all
```

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6. Sustainable Christmas trees (no script available)

https://youtu.be/uaB6kaJHB00?si=fvrLYUMxzQVez_MC

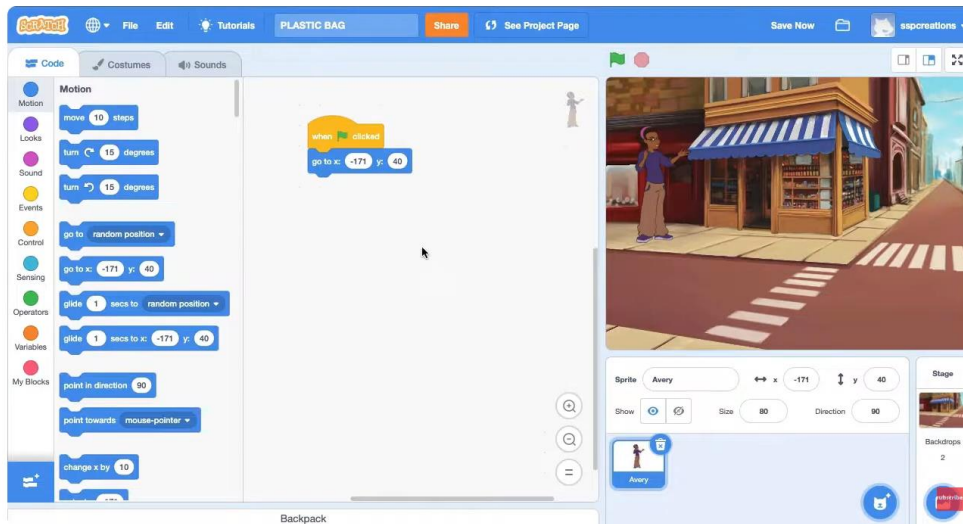


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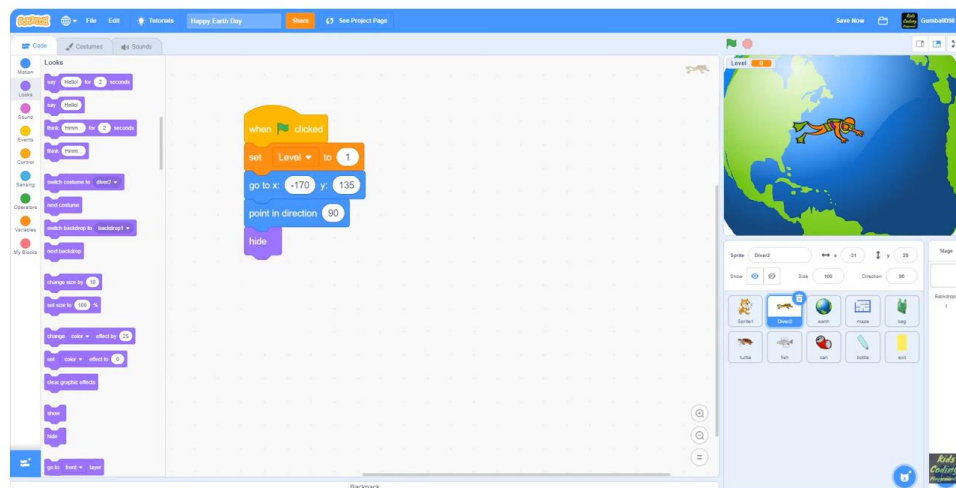
Scratch coding exercises from other public sources:

1. How to make "SAVE EARTH AND SAVE NATURE" project animation using Scratch - Scratch tutorial



<https://www.youtube.com/watch?v=7kGezU67fl4>

2. Scratch Tutorial | Happy Earth Day 2021 | Scratch Earth Day 2021 Project for Kids

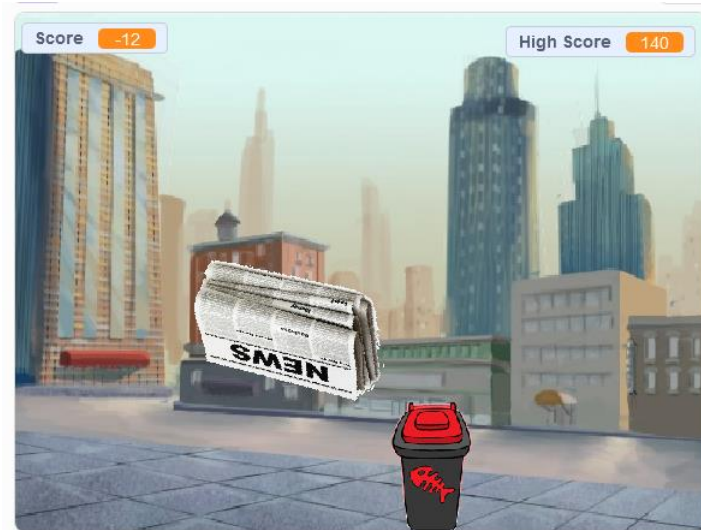


<https://www.youtube.com/watch?v=QDM9hA9daug&list=PLlryJer4FugisDEGqnvZiJ7tjhoWTrvU6&index=48>

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3. Sort The Rubbish, Use correct bins!



<https://scratch.mit.edu/projects/236841110>

```

BIN

when clicked
  set size to 60 %
  go to x: 0 y: -130
  forever
    if key left arrow pressed? then
      change x by -10
    if key right arrow pressed? then
      change x by 10

when up arrow key pressed
  next costume

when down arrow key pressed
  next costume

when clicked
  wait until speed < -10
  if Score > High Score then
    set High Score to Score
    say Well Done! New High Score! for 2 seconds
  else
    say Not Good Enough, Try Again! for 2 seconds
  stop all

```

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RUBBISH

```
When clicked
  go to x: 0 y: 180
  set size to 70 %
  set Score to 0
  set speed to -5
  forever
    change y by speed
    turn 15 degrees
    if y position < -180 then
      go to x: pick random -240 to 240 y: 180
      switch costume to pick random 1 to 3
      change Score by -1
      play drum (4) Crash Cymbal for 0 beats
    if touching Bin ? then
      if costume number = 1 and costume # of Bin = 1 then
        change Score by 5
        play drum (1) Share Drum for 0 beats
        create clone of myself
      if costume number = 2 and costume # of Bin = 2 then
        change Score by 5
        play drum (1) Share Drum for 0 beats
        create clone of myself
      if costume number = 3 and costume # of Bin = 3 then
        change Score by 5
        play drum (1) Share Drum for 0 beats
        create clone of myself
    go to x: pick random -240 to 240 y: 180
    switch costume to pick random 1 to 3
    change speed by -0.1
  When I start as a clone
    repeat 20
      go to Bin
      change size by -5
      change ghost effect by 5
      change color effect by 25
    delete this clone
```

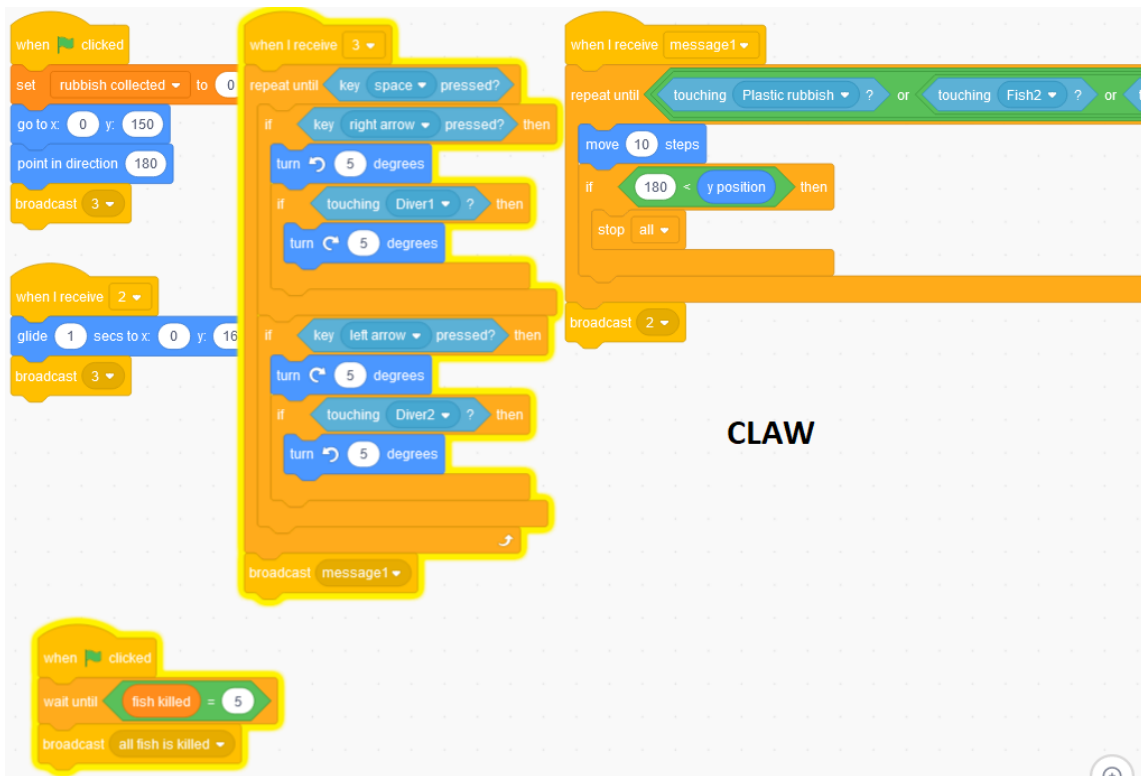
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4. Clean the reef, save the fish



<https://scratch.mit.edu/projects/236836590>



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PLASTIC RUBBISH

```
when clicked
hide
repeat 10
  create clone of myself
  next costume

when clicked
set rubbish collected to 0
wait until rubbish collected = 10
broadcast you win

when I start as a clone
go to x: pick random -240 to 240 y: pick random -20 to -176
show
forever
  if touching Claw ? then
    start sound hand clap
    go to x: x position of Claw y: y position of Claw
  if y position > 160 then
    start sound hand clap
    change rubbish collected by 1
    delete this clone
```

FISH

```
when I receive you win
stop other scripts in sprite
say THANK YOU! for 2 seconds
stop all


when clicked
switch costume to fish1
go to x: -226 y: pick random 0 to -176
forever
  glide 1.1 secs to x: 226 y: y position
  next costume
  glide 1.6 secs to x: -226 y: y position
  next costume

when clicked
set fish killed to 0
show
forever
  if touching Claw ? then
    change fish killed by 1
    hide
    play sound boing until done
```

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DIVER



```
when I receive all fish is killed
wait 2 seconds
say Try to be more careful next time for 2 seconds
stop all
```

FISH

```
when I receive you win
stop other scripts in sprite
say THANK YOU! for 2 seconds
stop all

when clicked
switch costume to fish2
go to x: 100 y: pick random 0 to -176
forever
  glide 2.5 secs to x: -226 y: y position
  next costume
  glide 2.7 secs to x: 226 y: y position
  next costume

when clicked
set fish killed to 0
show
forever
  if touching Claw ? then
    change fish killed by 1
  hide
  play sound boing until done
```

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Some other useful exercises:

1. <https://scratch.mit.edu/search/projects?q=circular%20economy>
2. <https://scratch.mit.edu/projects/936176525?fbclid=IwAR2A4PdiTCFIXv--DeyDxuhg68K0CfIRJuqZgs-dPSGszSoEsZAzCNK-yDc>
3. https://scratch.mit.edu/projects/938033511?fbclid=IwAR25Ng95UFgM9_ZrQ5SJLQiPsRjyhr t0nPp0V0AW29ugCYK5se78hiczsjY
4. https://scratch.mit.edu/projects/938033428?fbclid=IwAR1H5l_M_s4mfRma8WtAGF1jw_v6r r6vrMsUene2LGwn_tPC6Dy2XYRyFvs
5. https://scratch.mit.edu/projects/938033408?fbclid=IwAR3ciY_VpyQjIRSpC6eeAsrcRMCiHl uaDZY2LS4bI3cxz63UeXOXkiiI-Qo
6. How to code an Earth Day video game with Scratch • KCJ
<https://www.youtube.com/watch?v=k3xkPRITwws>
7. How to Make Trash Sorting Game on SCRATCH - By Putu Adi
<https://www.youtube.com/watch?v=pMdLhuARf8I>
8. How To Create Your Own Story In Scratch
<https://www.youtube.com/watch?v=TKjSGzViZL0>
9. Scratch jr games Earth day activities for kids 2021
<https://www.youtube.com/watch?v=-w7NxdQJGLM>
10. How to make a catching object game in scratch
<https://www.youtube.com/watch?v=l4UA9u0A4gQ>
11. Earth Day Scratch PSA
https://www.youtube.com/watch?v=mAOpdJ7_K9g
12. Trash disposal and segregation game made in SCRATCH
<https://www.youtube.com/watch?v=InqTbIhrrRA>
<https://scratch.mit.edu/projects/557130465/editor/>
13. Scratch Lesson 4 Plastic pollution in the ocean
<https://www.youtube.com/watch?v=1-VgOUfvGBU>
14. <https://www.create-learn.us/blog/scratch-projects-for-kids/>

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LESSON PLANS

Lesson 1: Swapping clothes

Introduction

In this lesson, learners think about textile waste reduction and their own attitude to buying clothing. They look at images showing the life stages of textile products, a landfill, and alternative ends to the life of an item of clothing. They consider the benefits of swapping clothes. This lesson can be used on its own or as an introductory part to lesson 2, with the aim to sensitize learners to the topic of swap shops and circular fashion.

In the follow-up lesson, learners work together to create a Scratch animation about a swap shop at school.

These two interconnected multidisciplinary lessons incorporate the subjects of English as a Second Language, Science and ICT.

Topic

Circular economy / Product life cycle / School swap shop + Scratch coding

Aims

- To raise awareness of the issue of ethical shopping
- To consider what a product life cycle
- To increase the life cycle of clothing by encouraging sharing and reuse, reducing the amount of clothes that end up in landfill
- To highlight the importance of reusing unwanted but usable items
- To review and learn vocabulary for circular economy and sustainability
- To promote group work and collaboration skills
- To engage students in a Scratch programming exercise
- To encourage students' creativity, and foster critical thinking skills

Age group and level

Primary pupils and above

Language level A2+

Lesson is adaptable to other age groups, languages and levels.

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Time (lessons 1 and 2)

90 – 120 minutes

Materials



- Picture of linear lifeline of textile
- Picture of landfill full of clothes
- Picture of the end of a garment's life cycle
- Materials for drawing, writing
- Computers, laptops or tablets

Procedure

1. Warmer (5 minutes)	Teacher presents a pullover/pair of jeans/T-shirt/blouse, etc. (or shows an image of it) and tells students that it is their favourite item of clothing. Tells the class about it, e.g. what it is, what it's made of, where and when they bought it, when they wear it, how long they've had it, why they like it so much, etc.
2. Activity (5-10 minutes)	Teacher asks learners to think about their favourite item of clothing. They go around and talk to fellow learners asking "What's your favourite item of clothing? Tell me about it!".
3. Discussion (5-10 minutes)	<p>Teacher creates groups of 4-5. Learners discuss the following questions:</p> <ul style="list-style-type: none">• How often do you buy/get a new item of clothing?• What do you do with outgrown clothes?• What do you do with clothes you do not need any more?• Do you have clothes in your wardrobe that you hardly ever wear? What will happen to them?• Are there clothes you are longing to have?• Do you ever buy clothes in second-hand shops? <p>Teacher asks for feedback from groups. What did they find out about each other?</p>


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<p>4. Introducing the topic (10-15 minutes)</p>	<p>Teacher shows their favourite item again and asks learners to map out what cycle they think this piece of clothing goes through from the birth or creation, the journey it took to be in their wardrobe, and its end of life. Students work in groups.</p> <p>Give students an A4 sheet of paper and encourage them to draw out the pictures and try and categorize the stages that they think this item of clothing goes through.</p> <p>When finished, groups go around and compare their map with those of other groups.</p> <p>Teacher asks groups to sit down and simplify the map to the five most important stages. Discuss what those stages are.</p>
<p>5. Activity (5 minutes)</p>	<p>Teacher shows the image of the linear product life cycle without the labels and asks learners to label the stages. Class feedback.</p> <p>Teacher asks if it is similar to their drawing. Class feedback.</p>  <p>Linear life cycle of textile</p>
<p>6. Activity (10 minutes)</p>	<p>Teacher shows them a picture of a landfill full of clothes.</p>  <p>Landfill photo from Vecteezy</p>

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	<p>Class discussion. Questions to learners:</p> <ul style="list-style-type: none"> • Why did those clothes end up in the landfill? • Where did they come from? • Do you know how long it takes for a T-shirt to decompose? (organic cotton T-shirt up to 5 months, polyester materials 20-200 years) <p>Critical thinking questions:</p> <ul style="list-style-type: none"> • What is the problem with this landfill? (Possible answers: smelly, ugly, harmful to the environment. Some elicitation may be needed.) • Do you think this is OK? • Can we do anything about it? <p>Teacher to discuss this briefly or in a little more detail, depending on learners. The aim is to raise learners' awareness of the issue and that it exists worldwide, and that it's not OK. They do not need to have any concrete ideas of how it can be solved at this stage, but can be encouraged to share if they do.</p>
<p>7. Activity (5 minutes)</p>	<p>Teacher asks learners to rethink the last stage of the textile life cycle. Group discussion.</p> <ul style="list-style-type: none"> • Do items always have to end up in a landfill? • Can they think of other ways of making the life of a piece of clothing longer? <p>After some brainstorming, Teachers shows them this image. Did they have similar ideas? Could they come up with more ideas? Class discussion.</p>  <p>End of a life cycle of a garment</p> <p>(Possible answers: repairing, upcycling, donating, giving it to friends or younger family members, reusing, recycling, selling it, swapping it for something else, turning it into a wiping cloth, etc.)</p>



8. Discussion (5-10 minutes)	<p>Teacher asks students if they have ever swapped clothes with someone. Or if they have ever attended a swap shop event. If learners are unfamiliar with this event, Teachers explains it to them.</p> <p>Teacher to ask learners “What are the benefits of clothing swaps?” Learners should be encouraged to think of every aspect (advantages for them and the environment). Group discussion. Class feedback.</p> <p>Possible ideas:</p> <ul style="list-style-type: none">• Good for the environment• Promotes circular fashion• Reduces your carbon, water and waste footprint• Saves money• Gives clothes at least one more cycle of life• You can update your wardrobe• You can create a new style for yourself• You can recycle or upcycle an item in any way you want• Gives a sense of community <p>Teacher asks learners to think of ways they can promote the idea of swap shops to other learners at school. Following a short brainstorming session, learners share ideas with the whole class.</p>
9. Round-up	<p>Teacher asks reflective questions to learners:</p> <ul style="list-style-type: none">• What have we learned today?• What is the most interesting thing you learned today?• What idea are you taking home from today’s lesson?• Are you going to do anything differently from now on? <p>Class feedback.</p>
10. Project	Lesson 2: Learners create a Scratch animation based on the idea of school swap shops



Lesson 2: Coding exercise (School Swap Shop)

This lesson is for learners who already have a minimal knowledge of coding in Scratch.

Learners, however, may need to revise the main features shown in the Scratch window:

- **Stage:** A large white rectangle in the top-left corner where they can see all the animation/game. When they start Scratch, an orange cat will appear in the middle of this area. It is possible to choose from different backdrops for the stage. They click the purple “Choose a Backdrop” (at the bottom of the stage window) to pick a new backdrop.
- **Sprite List:** A “sprite” is a character or object in a game. E.g. the orange cat that appears when they start Scratch is a sprite. The area below the stage contains the list of sprites that they’re using in their current project. They click the purple “Choose a Sprite” button in the bottom right corner of this area to select a sprite. They can have several sprites in one project.
- **Block Palette:** This region contains all the programming blocks that they can use in their project. In Scratch, commands are given by using blocks. Blocks are instructions, they are colour-coded, and they can be fitted together like jigsaw puzzles. They are arranged into categories including Motion, Looks, Sound, Events, Control and others. Blocks can be dragged and dropped into the Code Area. Blocks can be removed by dragging the blocks back into the Block Palette.
- **Code Area (Scripts Area):** This is the large area on the right-hand side. Blocks are dragged here from the Block Palette. Scripts for their project are created by joining instruction blocks together.

The aim of this coding exercise is to create an animation, similar to this project:



[School Swap Shop](#)

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Procedure

Introduction (5 minutes)

The lesson starts with a recap of the previous lesson by the teacher asking questions. The questions help refresh pupils' memories, reminds them about content and topics from the previous lesson. The idea of swapping clothes and its benefits should also arise.

Teacher tells class they are now going to code a Scratch animation about swapping clothes at school. They can use the animation to promote the idea in their environment.

Pupils work in pairs to help each other in the coding process.

Coding instructions

Open Scratch and create a new project.

Choose a background for the stage that represents a school environment.

Select two girl sprites and two dress sprites. Place the sprites on the stage.

Select each dress, go to the "Costumes" tab on the top, and choose a different costume for each dress.

Make a sprite for the background text by painting a sprite and adding a textbox containing the text "School Swap Shop".

Select each sprite, go to the "Events" category and drag the "when green flag clicked" block into the scripting area. Go to the "Motion" category and attach "go to x _ y _".

Select the first girl sprite. Go to the "Events" category and attach "wait _ seconds" to the previously added blocks, and input 3 seconds. Go to the "Looks" category and attach the "say _ for _ seconds" block. Input 4 seconds, and make the sprite greet the other sprite, and ask her to swap clothes. Go to the "Events" category and attach "broadcast _", and create a new message called "action 1".

Select the second girl sprite. Go to the "Events" category and drag "when I receive _" into the code area and select "action 1". Make the sprite greet the other sprite, compliment her dress, and accept the swap for 4 seconds. Broadcast "action 2".

Select the first dress sprite. Drag "when I receive _" into the code area and select "action 2". Go to the "Motion" category and attach "glide _ seconds to [random position]", and select the second dress sprite, and make it glide for 3 seconds.

Repeat this process for the second dress sprite, but select the first dress sprite instead of the second one, then broadcast "action 3".

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Select the first girl sprite. Drag "when I receive" into the scripting area and select "action 3". Make the sprite thank the other sprite for the swap and compliment the dress for 4 seconds. Broadcast "action 4".

Select the second girl sprite. Drag "when I receive" into the code area and select "action 4". Make the sprite thank the other sprite for the swap, and express happiness about the dress and the swap shop for 4 seconds. Broadcast "action 5".

Select the first girl sprite. Drag "when I receive" into the code area and select "action 5". Make the sprite state her positive opinion about the swap shop for 12 seconds. Broadcast "action 6".

Select the first girl sprite. Drag "when I receive" into the scripting area and select "action 6". Make the sprite agree with the other sprite's previous statement for 6 seconds.

While coding, learners can freely select different backdrops, experiment with colours and sprites, add sounds, and decide on what sprites say.

If need be, teacher may decide to adapt the lesson to lower-level learners and create a shorter animation with learners.

By the end of the lesson learners will

- learn how to create simple animations using computer code
- learn to think creatively
- understand the logic of basic coding
- work collaboratively
- create simple programs
- develop their coding skills
- improve their problem-solving skills
- acquire skills that will help them when they later start real-world programming

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Circular Economy Quizzes

Quiz 1 – Advanced level

1. What is the main goal of a circular economy?

- a. Producing more waste
- b. Recycling only plastic
- c. Minimizing waste and maximizing resource efficiency
- d. Ignoring environmental impact

2. Which of the following is a key principle of a circular economy?

- a. Linear production
- b. Throwaway culture
- c. Reduce, Reuse, Recycle
- d. Single-use mindset

3. What does "Reduce" mean in the context of a circular economy?

- a. Increasing consumption
- b. Decreasing waste
- c. Ignoring environmental concerns
- d. Using disposable products

4. In a circular economy, what does the term "Upcycling" refer to?

- a. Breaking down materials for recycling
- b. Downgrading materials
- c. Turning waste into a higher-value product
- d. Ignoring waste altogether

5. Why is the concept of "Closing the Loop" important in a circular economy?

- a. To increase waste generation
- b. To create a linear production cycle
- c. To minimize the end-of-life impact of products
- d. To ignore resource conservation

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6. What is the purpose of the "Sharing Economy" in a circular economy?

- a. Encouraging hoarding of resources
- b. Promoting individual ownership
- c. Enhancing collaborative consumption and resource sharing
- d. Ignoring community involvement

7. Which of the following is an example of a circular economy practice in product design?

- a. Planned obsolescence
- b. Single-use packaging
- c. Designing products for durability and recyclability
- d. Ignoring sustainability concerns

8. What role does recycling play in a circular economy?

- a. A limited and unnecessary practice
- b. The primary solution for waste management
- c. A key element in keeping materials in circulation
- d. Ignoring environmental responsibility

9. Why is it important to prioritize the use of renewable energy sources in a circular economy?

- a. To increase greenhouse gas emissions
- b. To deplete natural resources
- c. To minimize the environmental impact of energy consumption
- d. Ignoring climate change concerns

10. What does the term "Cradle to Cradle" mean in a circular economy context?

- a. Designing products for a one-time use
- b. Focusing on linear production cycles
- c. Ensuring that products are recyclable
- d. Designing products with the intention that all materials can be reused or recycled indefinitely

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Quiz 1 - Answer Key:

1. c. Minimizing waste and maximizing resource efficiency
2. c. Reduce, Reuse, Recycle
3. b. Decreasing waste
4. c. Turning waste into a higher-value product
5. c. To minimize the end-of-life impact of products
6. c. Enhancing collaborative consumption and resource sharing
7. c. Designing products for durability and recyclability
8. c. A key element in keeping materials in circulation
9. c. To minimize the environmental impact of energy consumption
10. d. Designing products with the intention that all materials can be reused or recycled indefinitely

<https://chat.openai.com/c/8d5be7f5-f705-4f8e-8c18-469da0467927>

Quiz 2 online – Advanced level



<https://youtu.be/8jXiOpx8I4>

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Quiz 3 – for upper primary pupils

1. What is the main goal of a circular economy?

- a) To waste resources
- b) To reuse and recycle resources
- c) To use resources only once

2. Which of the following is an example of recycling in a circular economy?

- a) Throwing plastic bottles in the trash
- b) Composting food scraps
- c) Repairing a broken toy instead of throwing it away

3. What is the concept of "reduce" in the context of a circular economy?

- a) Using more resources
- b) Using fewer resources
- c) Ignoring resource usage

4. In a circular economy, what happens to products at the end of their life cycle?

- a) They are discarded in landfills
- b) They are recycled or repurposed
- c) They are left in the environment

5. How can you contribute to a circular economy at home?

- a) Buy single-use items
- b) Throw away broken toys and gadgets
- c) Donate or recycle items you no longer need

6. What is upcycling in a circular economy?

- a) Throwing away old clothes
- b) Repurposing or transforming old items into something new
- c) Ignoring the use of old materials

7. Which of the following is an example of a renewable resource in a circular economy?

- a) Fossil fuels
- b) Solar energy
- c) Plastic bottles

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8. Why is it important to reduce the use of single-use plastics in a circular economy?

- a) Because they are colourful
- b) Because they can be used only once and create waste
- c) Because they are cheap

9. What does the term "closed loop" mean in a circular economy?

- a) Using resources only once
- b) Continuously reusing and recycling materials
- c) Ignoring the environmental impact of products

10. What is the role of consumers in a circular economy?

- a) To use products and throw them away
- b) To demand sustainable products and practices
- c) To ignore the environmental impact of their choices

Quiz 3 – Answer key:

- 1. b) To reuse and recycle resources
- 2. c) Repairing a broken toy instead of throwing it away
- 3. b) Using fewer resources
- 4. b) They are recycled or repurposed
- 5. c) Donate or recycle items you no longer need
- 6. b) Repurposing or transforming old items into something new
- 7. b) Solar energy
- 8. b) Because they can be used only once and create waste
- 9. b) Continuously reusing and recycling materials
- 10. b) To demand sustainable products and practices

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Quiz 4 - for lower primary pupils

1. What does "recycling" mean in the context of the circular economy?

- a) Throwing away trash
- b) Turning waste into new products
- c) Eating healthy food

2. Which of the following is a way to reduce waste?

- a) Using single-use plastics
- b) Reusing containers and bags
- c) Littering in the park

3. What can we do with old clothes that we don't wear anymore?

- a) Throw them in the trash
- b) Donate or recycle them
- c) Keep them in the closet forever

4. How can we save energy and resources at home?

- a) Leaving lights and appliances on when not needed
- b) Turning off lights and appliances when not in use
- c) Using more water for washing

5. What is composting?

- a) Throwing garbage on the street
- b) Turning organic waste into nutrient-rich soil
- c) Ignoring environmental issues

6. Why is it important to use both sides of a piece of paper?

- a) Because it's more fun
- b) To save trees and reduce paper waste
- c) Because the teacher said so

7. Which is a better option for the environment?

- a) Buying single-use water bottles
- b) Using a reusable water bottle
- c) Drinking water from the tap

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8. What can we do to help protect the Earth?

- a) Waste resources and energy
- b) Reduce, reuse, and recycle
- c) Ignore environmental problems

9. How can we make old toys useful again?

- a) Throw them away
- b) Donate or share with friends
- c) Keep them in a corner to collect dust

10. What does the circular economy aim to achieve?

- a) Wasting resources
- b) Conserving resources and minimizing waste
- c) Ignoring the environment for economic growth

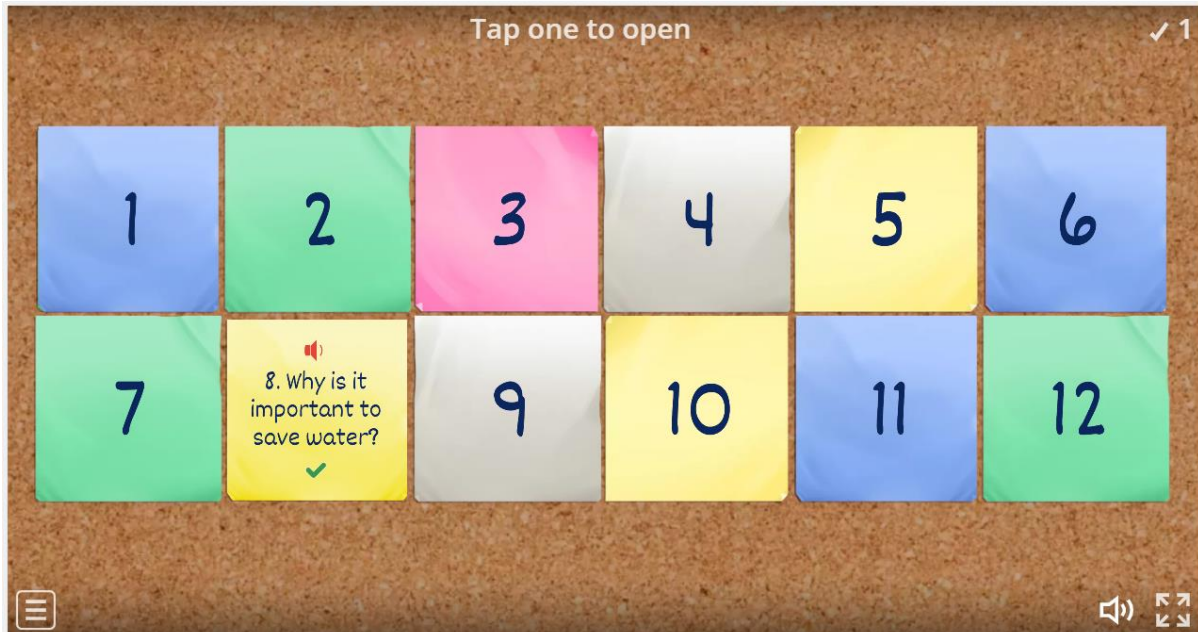
Quiz 4 - Answer Key

- 1. b) Turning waste into new products
- 2. b) Reusing containers and bags
- 3. b) Donate or recycle them
- 4. b) Turning off lights and appliances when not in use
- 5. b) Turning organic waste into nutrient-rich soil
- 6. b) To save trees and reduce paper waste
- 7. b) Using a reusable water bottle
- 8. b) Reduce, reuse, and recycle
- 9. b) Donate or share with friends
- 10. b) Conserving resources and minimizing waste

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Quiz 5 – online quiz for lower primary pupils



<https://wordwall.net/resource/66999804>

Other online quizzes:

<https://wordwall.net/resource/52522736/quiz-about-circular-economy-easy>

<https://quizizz.com/admin/quiz/60b0da87e6df86001bf475ac/circular-economy>

<https://transition-china.org/environmentposts/do-you-really-understand-circular-economy-quiz-yourself-here/>

<https://zone.recycledevon.org/wp-content/uploads/Class-Quiz-2.pdf>

<https://www.theguardian.com/sustainable-business/quiz/how-much-you-know-test-knowledge-circular-economy-quiz>

<https://www.purposegames.com/game/circular-economy>

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