

Welsh Progression 2

Science and Technology

a Curriculum For Circular Economy Curriculum Complementing the Welsh Framework



© The Sustainables Academy - Published May 2025.

This outline, grounded in the Welsh curriculum, provides a foundation for planning teaching, learning, and experiences that promote Circular Economy . It is designed to be flexible, allowing teachers to adapt the learning to meet the needs of their specific cohort. Co-creating learning experiences is encouraged, fostering collaboration between educators and students. This progression pathway aims to support teachers in their planning and implementation of Circular Economy -focused education.

Overarching Objectives for Progression Step 2:

- Encourage curiosity and engagement with the world.
- Develop critical thinking and problem-solving skills.
- Promote personal, social, and cultural development.
- Foster a sense of responsibility for personal health, well-being, and the environment.

The Curriculum of Wales

Expressive Arts	Health and Wellbeing	Humanities (including History, Geography, Religion, Values, and Ethics)	Languages, Literacy, and Communication (including Welsh and International Languages)	Mathematics and Numeracy	Science and Technology
Expressive Arts Subject Areas: Music, Drama, Art, Dance, Film and Digital Media. Objectives: Develop creativity and imagination. Explore a range of media, techniques, and materials.	Health and Well-being Subject Areas: Physical Health, Mental and Emotional Well-being, Relationships, Healthy Eating, Personal Safety. Objectives:	Humanities Subject Areas: History, Geography, Religious Education, Business Studies, and Social Studies. Objectives: Understand past and present human experiences, locally and globally.	Languages, Literacy and Communication Subject Areas: English, Welsh, Modern Foreign Languages, Literature, Oracy. Objectives: Develop competence in both Welsh and English.	Mathematics and Numeracy Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling. Objectives: Develop understanding of numbers, patterns, and shapes.	Science and Technology Subject Areas: Biology, Chemistry, Physics, Computer Science, Design and Technology. Objectives: Begin to explore the natural world and

Express ideas and feelings through different artistic forms. Begin to reflect on their own work and that of others.	Understand physical health and its connection to well-being. Develop emotional literacy and manage feelings. Learn about making healthy choices (diet, exercise). Build interpersonal skills to foster positive relationships.	Develop a sense of belonging and identity. Learn about sustainability and the impact of human actions on the planet. Begin to explore ethical questions and different belief systems.	Explore the use of language for different purposes (e.g., storytelling, explaining, persuading). Learn to communicate effectively through speech and writing. Engage with a range of literary texts, including Welsh literature.	Solve practical problems using basic mathematical techniques. Begin to understand and apply mathematical reasoning. Learn to use data to interpret the world around them.	understand simple scientific concepts. Engage with technology and develop basic computational thinking. Design, make, and evaluate simple products and systems. Explore sustainability through understanding energy and material use.
---	--	--	---	--	---

The Sustainability Curriculum Headings

Understanding the Circular Economy (CIRC1)	Waste Reduction and Recycling (CIRC 2)	Sustainable Consumption (CIRC 3)	Product Lifecycle and Design. (CIRC4)	Repair and Upcycling (CIRC5)	Circular Business Practices and innovation (CIRC6)
--	--	--	---	--	--

Local Economies and Community Engagement (CIRC 7)	Environmental Impact and Resource Conservation (CIRC8)	Citizenship and Global Responsibility (CIRC 9)	Food Systems (Circ 10)	Circular Technologies and Innovation (CIRC11)	Outdoor Learning (CIRC12)
---	---	--	---------------------------	---	----------------------------------

The Sustainability Curriculum Model linked to the
Curriculum of Wales -
Progression Step 2

Understanding Circular Economy

 (SUS1)

Science and Technology

Objective:

Learners will begin to understand the circular economy by exploring how materials and energy can be reused, recycled, and reduced in both natural and human-made systems. They will investigate how living things use resources efficiently (Biology), how materials change and can be reused (Chemistry), how energy is transferred and conserved (Physics), how data and systems help manage resources (Computer Science), and how to design simple products that reduce waste (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by observing how natural systems reuse resources (e.g., plant cycles, composting).
- "Engage with technology and develop basic computational thinking" – by using simple digital tools to track materials or model how products are reused.
- "Design, make, and evaluate simple products and systems" – by designing items that can be reused or recycled (e.g., lunch containers, toys).
- "Explore sustainability through understanding energy and material use" – by understanding waste and how it can be transformed into new resources.

SDG Connections:

- SDG 12: Responsible Consumption and Production – understanding how we can reduce, reuse, and recycle materials.
- SDG 13: Climate Action – recognising that circular systems help reduce emissions.

- SDG 9: Industry, Innovation and Infrastructure – exploring new ideas for sustainable product design.

UNCRC Rights:

- Article 29 – Education must develop every child's talents and prepare them to live responsibly and sustainably.
- Article 24 – Children have the right to a clean environment and information to help them stay healthy.

UNRMS Principles:

- Promote resource efficiency and circularity.
- Support the interconnectedness of natural and human systems for long-term sustainability.
- Encourage participatory learning that links local actions to global impacts.

Waste Reduction and Recycling

(CIRC 2)

Science and Technology

Objective:

Learners will explore how waste is created and how it can be reduced, reused, and recycled. They will investigate natural cycles of decomposition and renewal (Biology), observe how materials can be separated and changed for reuse (Chemistry), understand how energy is used and saved in recycling processes (Physics), use simple digital tools to sort, categorise, or track waste (Computer Science), and design simple products or systems that minimise waste and promote reuse (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning how nature breaks down and reuses organic waste.
- "Engage with technology and develop basic computational thinking" – by using basic coding or data collection to monitor waste habits or recycling.
- "Design, make, and evaluate simple products and systems" – by creating or improving everyday items to reduce single-use waste.
- "Explore sustainability through understanding energy and material use" – by learning how recycling saves resources and reduces environmental impact.

SDG Connections:

- SDG 12: Responsible Consumption and Production – supporting sustainable practices to reduce waste.
- SDG 11: Sustainable Cities and Communities – promoting local waste solutions.
- SDG 13: Climate Action – reducing landfill and pollution through recycling.

UNCRC Rights:

- Article 24 – Every child has the right to a clean environment.
- Article 29 – Education should help children understand and care for the world.

UNRMS Principles:

- Support the circular use of resources by understanding material life cycles.
- Encourage waste minimisation and resource recovery at a local level.
- Build systems thinking from an early age through observation and experimentation.

(CIRC 3)

Science and Technology

Objective:

Learners will explore the idea of sustainable consumption by investigating where products come from, how they are made, and how using fewer or better-chosen items can help protect the planet. They will observe how living things consume natural resources to survive (Biology), investigate how materials are transformed in everyday items (Chemistry), consider the energy used in making and transporting goods (Physics), use digital tools to compare product choices or track usage (Computer Science), and design simple solutions to reduce overuse or waste of products (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by recognising how resource use affects plants, animals, and habitats.
- "Engage with technology and develop basic computational thinking" – by sorting and analysing data about everyday products and their environmental impact.
- "Design, make, and evaluate simple products and systems" – by creating or improving items to be more sustainable (e.g. reusable packaging or multi-use tools).
- "Explore sustainability through understanding energy and material use" – by learning how conscious consumption can reduce waste, pollution, and energy use.

SDG Connections:

- SDG 12: Responsible Consumption and Production – supporting choices that reduce environmental harm.
- SDG 3: Good Health and Well-being – recognising how sustainable consumption can lead to healthier lifestyles.
- SDG 15: Life on Land – understanding how overconsumption harms biodiversity.

UNCRC Rights:

- Article 24 – Right to health and a clean environment.
- Article 29 – Education should develop children's respect for the environment and prepare them to make responsible choices.

UNRMS Principles:

- Promote the efficient and responsible use of resources throughout their life cycles.
- Encourage understanding of resource interconnectivity and long-term sustainability.
- Embed resource-conscious behaviour through early learning and participation.

Product Lifecycle and Design.

(CIRC4)

Science and Technology

Objective:

Learners will explore the idea of sustainable consumption by investigating where products come from, how they are made, and how using fewer or better-chosen items can help protect the planet. They will observe how living things consume natural resources to survive (Biology), investigate how materials are transformed in everyday items (Chemistry), consider the energy used in making and transporting goods (Physics), use digital tools to compare product choices or track usage (Computer Science), and design simple solutions to reduce overuse or waste of products (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by recognising how resource use affects plants, animals, and habitats.
- "Engage with technology and develop basic computational thinking" – by sorting and analysing data about everyday products and their environmental impact.
- "Design, make, and evaluate simple products and systems" – by creating or improving items to be more sustainable (e.g. reusable packaging or multi-use tools).
- "Explore sustainability through understanding energy and material use" – by learning how conscious consumption can reduce waste, pollution, and energy use.

SDG Connections:

- SDG 12: Responsible Consumption and Production – supporting choices that reduce environmental harm.
- SDG 3: Good Health and Well-being – recognising how sustainable consumption can lead to healthier lifestyles.
- SDG 15: Life on Land – understanding how overconsumption harms biodiversity.

UNCRC Rights:

- Article 24 – Right to health and a clean environment.
- Article 29 – Education should develop children's respect for the environment and prepare them to make responsible choices.

UNRMS Principles:

- Promote the efficient and responsible use of resources throughout their life cycles.
- Encourage understanding of resource interconnectivity and long-term sustainability.
- Embed resource-conscious behaviour through early learning and participation.

(CIRC5)

Science and Technology

Objective:

Learners will begin to understand the value of repairing and upcycling items to reduce waste and care for Earth's resources. They will observe how natural systems repair and regenerate (Biology), explore how materials can be safely taken apart, rejoined, or altered (Chemistry), investigate how energy can be saved through repair rather than replacement (Physics), use simple digital tools to plan or document upcycling projects (Computer Science), and design and make improved or repurposed items from used materials (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by observing natural examples of regeneration and reuse (e.g. how trees heal, or shells are reused by animals).
- "Engage with technology and develop basic computational thinking" – by creating basic sequences or visual plans for repair and upcycling tasks.
- "Design, make, and evaluate simple products and systems" – by redesigning used objects into useful new items.
- "Explore sustainability through understanding energy and material use" – by learning how repair saves energy and raw materials compared to replacement.

SDG Connections:

- SDG 12: Responsible Consumption and Production – through extending the life of products.
- SDG 13: Climate Action – by reducing emissions linked to producing and disposing of goods.
- SDG 11: Sustainable Cities and Communities – by promoting local repair and reuse culture.

UNCRC Rights:

- Article 29 – Education must develop children’s respect for the environment and their ability to make sustainable choices.
- Article 12 – Children have the right to express their views and make decisions about the world they want to live in, including through creative repair and reuse.

UNRMS Principles:

- Encourage resource efficiency by promoting repair and upcycling as alternatives to consumption.
- Support the circular use of materials to minimise waste and environmental harm.
- Develop early skills in sustainable innovation and problem-solving through hands-on design tasks.

Circular Business Practices and innovation
(CIRC6)

Science and Technology

Objective:

Learners will begin to understand how businesses can be innovative and sustainable by using circular economy ideas, such as designing products that last longer, can be repaired or reused, and reduce harm to the environment. They will explore how nature works in cycles and regenerates (Biology), how materials behave and can be repurposed (Chemistry), how energy is used and saved in sustainable systems (Physics), use simple digital tools to plan or present ideas (Computer Science), and design imaginative solutions or models of businesses that reduce waste and protect Earth’s resources (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning from nature's systems (e.g. ecosystems and decomposition) to inspire regenerative design.
- "Engage with technology and develop basic computational thinking" – by using flowcharts or visual tools to represent circular product or service models.
- "Design, make, and evaluate simple products and systems" – by imagining businesses that make or repair items using fewer resources.
- "Explore sustainability through understanding energy and material use" – by recognising how businesses can reduce their environmental footprint.

SDG Connections:

- SDG 9: Industry, Innovation and Infrastructure – by promoting early understanding of sustainable and innovative business models.
- SDG 12: Responsible Consumption and Production – by encouraging efficient use of resources in systems and products.
- SDG 8: Decent Work and Economic Growth – by exploring fair and sustainable ways to meet human needs.

UNCRC Rights:

- Article 29 – Education should encourage children to understand and act to protect the environment.
- Article 12 – Children have the right to express their views and be involved in shaping a better future.

UNRMS Principles:

- Support innovation that regenerates and restores natural systems.
- Encourage integrated thinking about the flow of materials, energy, and design in business.
- Develop early skills for participation in responsible, future-facing economies.

Local Economies and Community Engagement

(CIRC 7)

Science and Technology

Objective:

Learners will begin to understand how local economies and community action can support sustainability by making, using, and sharing resources wisely. They will explore how living things work together in ecosystems (Biology), investigate the materials used in local products and how they can be reused or recycled (Chemistry), examine how local production and transport use energy (Physics), use simple digital tools to map local businesses or community resource flows (Computer Science), and design simple products or solutions that meet a local need while reducing waste (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning from how ecosystems share and cycle resources.
- "Engage with technology and develop basic computational thinking" – by collecting or sorting information about local businesses and products.
- "Design, make, and evaluate simple products and systems" – by responding to a real local challenge (e.g., designing for reuse in a school or neighbourhood).
- "Explore sustainability through understanding energy and material use" – by identifying how local choices affect the wider environment.

SDG Connections:

- SDG 11: Sustainable Cities and Communities – by supporting active local involvement and resilience.

- SDG 12: Responsible Consumption and Production – through community-based reuse, repair, and local sourcing.
- SDG 8: Decent Work and Economic Growth – by understanding the value of local jobs and small-scale innovation.

UNCRC Rights:

- Article 12 – Children have the right to express their views and participate in decisions that affect them and their communities.
- Article 29 – Education should help children learn how to respect the environment and contribute to their local and global communities.

UNRMS Principles:

- Promote local resource stewardship through community engagement and education.
- Support inclusive decision-making and participatory sustainability models.
- Encourage learning from place to build resilience and regeneration through local systems.

)Environmental Impact and Resource Conservation

(CIRC8)

Science and Technology

Objective:

Learners will begin to understand how everyday actions affect the environment and how natural and human-made resources can be conserved. They will explore how living things are affected by changes in their environment (Biology), investigate how materials can be reused or conserved (Chemistry), examine how energy is used and how conservation can reduce impact (Physics), use digital tools to model or record environmental changes (Computer Science), and design or

improve simple products to reduce resource use and environmental harm (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by observing how pollution or overuse of resources affects plants, animals, and habitats.
- "Engage with technology and develop basic computational thinking" – by collecting or displaying data about energy or material use (e.g., water usage chart).
- "Design, make, and evaluate simple products and systems" – by creating items that use fewer resources or produce less waste.
- "Explore sustainability through understanding energy and material use" – by recognising how conserving resources protects the planet.

SDG Connections:

- SDG 13: Climate Action – by understanding the link between consumption and environmental impact.
- SDG 12: Responsible Consumption and Production – by learning ways to use fewer materials and recycle more.
- SDG 15: Life on Land – by protecting ecosystems through conservation.

UNCRC Rights:

- Article 24 – Every child has the right to a safe and healthy environment.
- Article 29 – Education should help children develop respect for the natural world and make positive environmental choices.

UNRMS Principles:

- Foster awareness of the relationship between resource use and environmental impact.
- Encourage early decision-making skills that support sustainable behaviour.
- Promote resource conservation as a shared responsibility essential for future wellbeing.

Citizenship and Global Responsibility

(CIRC 9)

Science and Technology

Objective:

Learners will begin to understand how their actions, choices, and use of resources affect the wider world and the lives of others. They will explore how living things are connected in global ecosystems (Biology), investigate how the production and disposal of materials can affect people and places (Chemistry), consider how energy use links to global challenges like climate change (Physics), use digital tools to share ideas and information about sustainability (Computer Science), and design simple products or solutions that demonstrate care for people and planet (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning how global ecosystems are affected by local actions.
- "Engage with technology and develop basic computational thinking" – by using digital tools to communicate responsible actions or track environmental change.
- "Design, make, and evaluate simple products and systems" – by developing products that reduce harm or help others in their community or globally.
- "Explore sustainability through understanding energy and material use" – by understanding how mindful consumption contributes to global fairness.

SDG Connections:

- SDG 4.7: Ensure learners acquire knowledge and skills to promote sustainable development, including global citizenship.

- SDG 10: Reduced Inequalities – by understanding that access to clean water, energy, and resources varies around the world.
- SDG 17: Partnerships for the Goals – by learning to work together and share responsibility for a better future.

UNCRC Rights:

- Article 12 – Right to be heard and take part in decisions affecting them.
- Article 29 – Education must develop respect for others and the environment, preparing children to live responsibly and peacefully.
- Article 24 – Right to a healthy environment and to learn how to care for it.

UNRMS Principles:

- Support active and informed participation in sustainability decisions at all levels.
- Promote understanding of global interdependence in natural and human systems.
- Encourage responsible resource citizenship, where actions reflect care for others and the environment.

Food Systems (Circ 10)

Science and Technology

Objective:

Learners will begin to understand how food is produced, consumed, and managed in a circular system that reduces waste and protects natural resources. They will explore how plants and animals grow and interact in food chains (Biology), investigate how food changes during preparation and storage (Chemistry), understand the energy involved in growing, transporting, and storing food (Physics), use digital tools to track food journeys or waste (Computer Science), and design simple systems or packaging solutions that help reduce food waste or encourage composting (Design and Technology).

Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning where food comes from and how it connects to ecosystems.
- "Engage with technology and develop basic computational thinking" – by creating simple sequences or maps of a food product's journey from farm to table.
- "Design, make, and evaluate simple products and systems" – by designing food packaging or kitchen solutions that reduce waste or allow reuse.
- "Explore sustainability through understanding energy and material use" – by understanding the energy and resources needed to grow, transport, and manage food.

SDG Connections:

- SDG 2: Zero Hunger – understanding fair, nutritious, and sustainable food systems.
- SDG 12: Responsible Consumption and Production – reducing food waste and encouraging composting or reuse.
- SDG 13: Climate Action – recognising that sustainable food systems lower carbon emissions.

UNCRC Rights:

- Article 24 – Right to nutritious food and a clean environment.
- Article 29 – Education should teach children to respect and protect natural resources and the environment.

UNRMS Principles:

- Encourage sustainable management of biological resources, including food and soil systems.
- Promote understanding of resource loops, such as composting and local growing.
- Support systems thinking about how food impacts health, nature, and the economy.

(CIRC11)

Science and Technology

Objective:

Learners will begin to understand how technology and innovation can help reduce waste, reuse materials, and create systems that work in harmony with nature. They will explore natural systems that cycle energy and materials (Biology), investigate how materials can be transformed and reused safely (Chemistry), consider how energy is stored, transferred, and saved in circular technologies (Physics), use digital tools to explore and model circular solutions (Computer Science), and design simple products or systems that reflect circular innovation, such as repairable items or low-waste packaging (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by learning from how ecosystems reuse and recycle resources.
- "Engage with technology and develop basic computational thinking" – by using basic algorithms or simulations to explore circular product ideas.
- "Design, make, and evaluate simple products and systems" – by creating or improving items to be reusable, repairable, or modular.
- "Explore sustainability through understanding energy and material use" – by recognising the role of innovation in reducing environmental impact.

SDG Connections:

- SDG 9: Industry, Innovation and Infrastructure – promoting early creativity in sustainable design and technologies.
- SDG 12: Responsible Consumption and Production – reducing material use and waste through smart design.

- SDG 13: Climate Action – lowering environmental impact through sustainable technologies.

UNCRC Rights:

- Article 29 – Education should support children’s talents and help them contribute to a sustainable world.
- Article 13 – Children have the right to share ideas and inventions to improve their communities.

UNRMS Principles:

- Promote early understanding of resource circularity and regenerative innovation.
- Encourage learners to become innovative problem-solvers who design with nature in mind.
- Support systemic thinking by helping learners make connections between technology, nature, and sustainability.

Outdoor Learning and Circularity of Nature Circ 12)

Science and Technology

Objective:

Learners will explore natural environments to understand how the circular economy exists in nature, where nothing is wasted and everything has a role in sustaining life. Through outdoor learning experiences, they will observe how plants, animals, and ecosystems cycle nutrients and materials (Biology), explore natural decomposition and changes in matter (Chemistry), examine how sunlight, water, and gravity help move energy in natural systems (Physics), use digital tools to record outdoor observations (Computer Science), and design simple nature-inspired systems that reflect circular principles such as composting or bug hotels (Design and Technology).



Curricular and Global Links

Curriculum for Wales – Science and Technology:

- "Explore the natural world and understand simple scientific concepts" – by investigating how leaves become soil, animals reuse nests, or fungi break down matter.
- "Engage with technology and develop basic computational thinking" – by using digital devices or apps to map cycles in a local ecosystem.
- "Design, make, and evaluate simple products and systems" – by creating natural circular systems (e.g., worm farms, seed dispensers, or wildlife shelters).
- "Explore sustainability through understanding energy and material use" – by recognising how natural systems reuse materials and minimise waste.

SDG Connections:

- SDG 15: Life on Land – encouraging care for terrestrial ecosystems and biodiversity.
- SDG 12: Responsible Consumption and Production – learning from nature to design more sustainably.
- SDG 13: Climate Action – understanding how healthy natural systems absorb carbon and regulate climate.

UNCRC Rights:

- Article 29 – Education should help children learn to respect the natural world and act responsibly.
- Article 31 – Right to rest, play, and learn through outdoor activities.
- Article 24 – Right to a clean and healthy environment.

UNRMS Principles:

- Promote awareness of natural cycles and regenerative systems.
- Support outdoor, place-based learning that fosters a connection to nature and local resources.
- Encourage thinking about how humans can mimic and protect natural circular systems in their own lives and communities.

