

England - Computer Science and Technology KS1 Curriculum For Sustainability Complementing the KS1 Framework England



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Computing/ Design and Technology

Computer Science (coding, algorithms, computational thinking)

Information Technology (using software, internet safety)

Digital Literacy (understanding digital devices and their uses)

Designing

Making

Evaluating

Technical Knowledge

The Sustainability Curriculum Headings

Understanding Sustainability (SUS1)	Environmental Awareness (SUS2)	Environmental Stewardship (SUS3)	Waste Management (SUS4)	Energy Conservation (SUS5)	Biodiversity and Ecosystems (SUS6)
Climate Change and Adaptation (SUS7)	Food and Agriculture (SUS8)	Water Conservation (SUS9)	Sustainable Transport and Urban Planning (SUS10)	Citizenship / Global Responsibility and Sustainable Development (SUS11)	Outdoor Learning and Connection to Nature (SUS12)

Understanding
Sustainability

Computing/ Design and Technology

Computer Science:

Coding:

Understand that computers can be programmed to perform tasks that help solve environmental challenges, such as monitoring air quality or managing energy consumption.

Explore basic coding concepts like sequencing and loops through simple programming activities related to sustainability, such as coding a virtual plant watering system.

Algorithms:

Recognise that algorithms are sets of instructions used by computers to solve problems and that they can be applied to environmental issues, such as sorting recycling materials or optimising energy usage.

Computational Thinking:

Develop computational thinking skills by identifying patterns and decomposing problems related to sustainability, such as creating step-by-step instructions for recycling or conserving water at home.

Information Technology:

Using Software:

Learn to use educational software and digital tools to explore sustainability topics, such as interactive simulations of renewable energy

sources or virtual tours of eco-friendly buildings.

Internet Safety:

Understand the importance of internet safety when researching sustainability topics online, including identifying trustworthy sources and practising responsible online behaviour.

Digital Literacy:

Understanding Digital Devices:

Identify different digital devices and understand how they can be used to support sustainability efforts, such as using tablets or smartphones to monitor energy usage or track environmental data.

Design and Technology:

Designing:

Develop design skills by creating simple prototypes or models of eco-friendly inventions or solutions, such as designing a compost bin or a water-saving device.

Making:

Engage in hands-on making activities to bring sustainability-focused designs to life, using materials like recycled paper, cardboard, or natural materials.

Evaluating:

Learn to evaluate the effectiveness of their designs and solutions in addressing sustainability challenges, considering factors such as functionality, durability, and environmental impact.

Technical Knowledge:

Gain basic technical knowledge related to sustainability, such as understanding how renewable energy sources like solar panels or wind turbines work, or how recycling processes function.

Environmental Awareness

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to create digital simulations and games that teach about environmental concepts, such as ecosystems, pollution, or renewable energy.

Algorithms:

Explore algorithms in the context of environmental challenges, such as developing algorithms to sort waste or to model natural processes like photosynthesis.

Computational Thinking:

Apply computational thinking skills to environmental scenarios, such as identifying cause-and-effect relationships in ecosystems or

analysing data related to climate change.

Information Technology:

Using Software:

Use educational software and interactive tools to explore environmental topics, such as virtual field trips to natural habitats or interactive maps showing environmental data.

Internet Safety:

Learn about internet safety guidelines when researching environmental issues online, including understanding how to verify information and protect personal data.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used for environmental monitoring and conservation, such as weather sensors, wildlife cameras, or GPS trackers, and understand their functions.

Design and Technology:

Designing:

Design digital or physical products that promote environmental awareness and sustainability, such as creating eco-friendly packaging or designing a website to raise awareness about endangered species.

Making:

Engage in hands-on making activities to create prototypes or models of environmental solutions, using recycled materials or digital fabrication tools like 3D printers.

Evaluating:

Evaluate the environmental impact of design choices and technological solutions, considering factors such as energy efficiency, material sustainability, and potential ecological footprint.

Technical Knowledge:

Gain basic technical knowledge related to environmental monitoring and conservation technologies, such as understanding how sensors collect environmental data or how to interpret digital maps showing ecological features.

Environmental Stewardship

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to develop applications and games that promote environmental stewardship, such as recycling games or energy-saving simulations.

Algorithms:

Explore algorithms that optimise resource use and promote sustainability, such as algorithms for route optimization to reduce fuel consumption or for smart energy management.

Computational Thinking:

Apply computational thinking to environmental challenges, such as decomposing complex environmental problems into smaller, manageable tasks and identifying patterns in environmental data.

Information Technology:

Using Software:

Utilise software tools to explore environmental issues and solutions, such as using GIS (Geographic Information Systems) software to analyse environmental data or creating digital presentations on conservation efforts.

Internet Safety:

Learn about internet safety practices when researching environmental topics online, including identifying reliable sources of information and understanding the importance of privacy and security.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used for environmental monitoring and conservation, such as weather stations, air quality sensors, or wildlife tracking devices, and understand their role in environmental stewardship.

Design and Technology:

Designing:

Design digital or physical solutions that promote environmental stewardship, such as designing eco-friendly packaging or creating digital campaigns to raise awareness about conservation efforts.

Making:

Engage in hands-on making activities to create prototypes or models of sustainable products or solutions, using recycled materials or sustainable manufacturing techniques.

Evaluating:

Evaluate the environmental impact of design choices and technological solutions, considering factors such as energy efficiency, material sustainability, and long-term ecological consequences.

Technical Knowledge:

Gain technical knowledge related to environmental technologies, such as understanding how sensors work to monitor environmental parameters or how renewable energy systems are designed and implemented.

Waste Management

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to develop applications or games that educate about waste management practices, such as sorting recyclables or reducing waste through composting.

Algorithms:

Explore algorithms for optimising waste collection routes or for sorting waste materials efficiently, promoting proper waste management practices.

Computational Thinking:

Apply computational thinking to waste management scenarios, such as identifying patterns in waste generation or developing solutions to reduce waste in the community.

Information Technology:**Using Software:**

Utilise software tools to track and analyse waste data, such as using spreadsheets to record waste amounts or using databases to monitor recycling rates.

Internet Safety:

Learn about internet safety when researching waste management information online, including verifying sources and understanding the importance of privacy and security.

Digital Literacy:**Understanding Digital Devices:**

Identify digital devices used in waste management, such as sensors for monitoring waste levels in bins or RFID tags for tracking waste containers, and understand their role in waste management systems.

Design and Technology:**Designing:**

Design solutions for waste reduction or recycling, such as designing eco-friendly packaging or creating posters and educational materials to promote waste awareness.

Making:

Engage in hands-on making activities to create prototypes or models of waste management systems, such as building a model recycling centre or designing a sorting game to teach about recycling.

Evaluating:

Evaluate the effectiveness of waste management solutions, considering factors such as ease of use, efficiency, and environmental impact.

Technical Knowledge:

Gain technical knowledge related to waste management technologies, such as understanding how waste sorting machines work or how waste-to-energy processes function.

Energy Conservation (**SUS5**)

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to develop applications or simulations that illustrate energy conservation concepts, such as turning off lights or reducing energy consumption in virtual environments.

Algorithms:

Explore algorithms for optimising energy usage, such as algorithms for scheduling tasks to minimise energy consumption or for controlling smart devices to adjust energy settings.

Computational Thinking:

Apply computational thinking to energy conservation scenarios, such as identifying patterns in energy usage data or developing solutions to reduce energy waste in everyday activities.

Information Technology:

Using Software:

Utilise software tools to monitor and analyse energy usage, such as using spreadsheets to track energy consumption or using energy monitoring apps to identify areas for improvement.

Internet Safety:

Learn about internet safety when researching energy conservation information online, including understanding how to evaluate sources and protect personal data.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used for energy conservation, such as smart thermostats, energy-efficient appliances, or solar panels, and understand their role in reducing energy consumption.

Design and Technology:

Designing:

Design products or solutions that promote energy conservation, such as designing energy-efficient lighting systems or creating posters and educational materials to raise awareness about energy-saving practices.

Making:

Engage in hands-on making activities to create prototypes or models of energy-saving devices, such as building a model solar cooker or designing a wind turbine.

Evaluating:

Evaluate the effectiveness of energy conservation solutions, considering factors such as energy savings, usability, and environmental impact.

Technical Knowledge:

Gain technical knowledge related to energy conservation technologies, such as understanding how renewable energy sources work or how energy-efficient appliances are designed and operated.

Biodiversity and Ecosystems (SUS6)**Computing/ Design and Technology****Computer Science:****Coding:**

Understand how coding can be used to create simulations or games that explore biodiversity and ecosystems, such as virtual habitats or interactive food webs.

Algorithms:

Explore algorithms for modelling ecological processes, such as algorithms for simulating predator-prey interactions or for analysing biodiversity data.

Computational Thinking:

Apply computational thinking skills to biodiversity and ecosystem scenarios, such as identifying patterns in animal behaviours or designing solutions to protect endangered species.

Information Technology:**Using Software:**

Utilise software tools to research and analyse biodiversity data, such as using databases to track species populations or using mapping software to visualise ecosystems.

Internet Safety:

Learn about internet safety when researching biodiversity and ecosystems online, including understanding how to evaluate sources and protect personal information.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used in biodiversity research and conservation, such as wildlife cameras, GPS trackers, or environmental sensors, and understand their role in ecosystem monitoring.

Design and Technology:

Designing:

Design products or solutions that promote biodiversity and ecosystem conservation, such as designing wildlife-friendly habitats or creating educational materials to raise awareness about local ecosystems.

Making:

Engage in hands-on making activities to create models or prototypes of ecosystems, such as building a mini-pond habitat or constructing a bird feeder to attract local wildlife.

Evaluating:

Evaluate the effectiveness of biodiversity conservation solutions, considering factors such as habitat suitability, species diversity, and environmental impact.

Technical Knowledge:

Gain technical knowledge related to biodiversity monitoring and conservation technologies, such as understanding how ecological surveys are conducted or how to interpret biodiversity data.

Climate Change and Adaptation

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to create simulations or games that illustrate the impacts of climate change and potential adaptation strategies, such as coding a virtual greenhouse or a weather monitoring system.

Algorithms:

Explore algorithms for analysing climate data and predicting future climate trends, such as algorithms for temperature forecasting or for modelling sea level rise.

Computational Thinking:

Apply computational thinking skills to climate change scenarios, such as identifying cause-and-effect relationships in climate systems or

developing solutions to mitigate the impacts of climate change.

Information Technology:

Using Software:

Utilise software tools to research and analyse climate change data, such as using interactive maps to explore climate patterns or using spreadsheets to track environmental changes.

Internet Safety:

Learn about internet safety when researching climate change information online, including understanding how to evaluate sources and discern credible information.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used in climate monitoring and adaptation, such as weather stations, climate sensors, or remote sensing devices, and understand their role in studying climate change.

Design and Technology:

Designing:

Design products or solutions that address climate change challenges or promote adaptation strategies, such as designing energy-efficient buildings or creating educational materials about renewable energy.

Making:

Engage in hands-on making activities to create prototypes or models of climate adaptation measures, such as building a model wind turbine or designing a rainwater harvesting system.

Evaluating:

Evaluate the effectiveness of climate adaptation solutions, considering factors such as resilience, sustainability, and community impact.

Technical Knowledge:

Gain technical knowledge related to climate science and adaptation technologies, such as understanding how greenhouse gases affect the climate or how renewable energy systems can help mitigate climate change.

Food and Agriculture

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to create educational games or simulations related to food production and agriculture, such as coding a virtual farm or a crop growth simulator.

Algorithms:

Explore algorithms for optimising agricultural processes, such as algorithms for irrigation scheduling or for predicting crop yields based on weather data.

Computational Thinking:

Apply computational thinking skills to agricultural scenarios, such as identifying patterns in plant growth or developing solutions to address pest infestations.

Information Technology:**Using Software:**

Utilise software tools to research and analyse agricultural data, such as using spreadsheets to track crop yields or using mapping software to plan farm layouts.

Internet Safety:

Learn about internet safety when researching agricultural information online, including understanding how to evaluate sources and protect personal data.

Digital Literacy:**Understanding Digital Devices:**

Identify digital devices used in agriculture, such as GPS-guided tractors, drones for crop monitoring, or soil sensors, and understand their role in modern farming practices.

Design and Technology:**Designing:**

Design products or solutions that improve food production or agricultural practices, such as designing efficient irrigation systems or creating packaging for farm produce.

Making:

Engage in hands-on making activities to create models or prototypes of agricultural tools or systems, such as building a model greenhouse or designing a simple hydroponic setup.

Evaluating:

Evaluate the effectiveness of agricultural solutions, considering factors such as productivity, sustainability, and economic viability.

Technical Knowledge:

Gain technical knowledge related to agricultural technologies, such as understanding soil health, plant growth factors, or the principles of sustainable farming practices.

Water Conservation

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to create simulations or interactive activities that educate about water conservation practices, such as coding a virtual water-saving game or a water usage calculator.

Algorithms:

Explore algorithms for optimising water usage, such as algorithms for scheduling irrigation or for detecting leaks in water systems.

Computational Thinking:

Apply computational thinking skills to water conservation scenarios, such as identifying patterns in water usage data or developing solutions to reduce water waste.

Information Technology:**Using Software:**

Utilise software tools to monitor and analyse water usage data, such as using spreadsheets to track water consumption or using water usage apps to identify areas for improvement.

Internet Safety:

Learn about internet safety when researching water conservation information online, including understanding how to evaluate sources and protect personal information.

Digital Literacy:**Understanding Digital Devices:**

Identify digital devices used in water conservation, such as smart water metres, leak detection sensors, or irrigation controllers, and understand their role in managing water resources.

Design and Technology:

Designing:

Design products or solutions that promote water conservation, such as designing water-efficient fixtures or creating educational materials to raise awareness about water-saving techniques.

Making:

Engage in hands-on making activities to create prototypes or models of water-saving devices, such as building a model rainwater harvesting system or designing a drip irrigation system.

Evaluating:

Evaluate the effectiveness of water conservation solutions, considering factors such as water savings, usability, and environmental impact.

Technical Knowledge:

Gain technical knowledge related to water conservation technologies, such as understanding how water-efficient appliances work or how to implement water-saving landscaping techniques.

Sustainable Transport and Urban Planning

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to create simulations or games that educate about sustainable transportation options, such as coding a virtual bike-sharing system or a public transportation planner.

Algorithms:

Explore algorithms for optimising transportation routes or for analysing traffic patterns to reduce congestion and emissions.

Computational Thinking:

Apply computational thinking skills to urban planning scenarios, such as identifying transportation needs in a community or developing solutions to improve pedestrian safety.

Information Technology:

Using Software:

Utilise software tools to analyse transportation data, such as using mapping software to plan bike lanes or using traffic simulation software to test road designs.

Internet Safety:

Learn about internet safety when researching transportation and urban planning information online, including understanding how to evaluate sources and protect personal data.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used in transportation and urban planning, such as GPS navigation systems, traffic sensors, or smart traffic lights,

and understand their role in improving mobility and safety.

Design and Technology:

Designing:

Design products or solutions that promote sustainable transportation, such as designing bike racks or creating pedestrian-friendly street designs.

Making:

Engage in hands-on making activities to create models or prototypes of transportation infrastructure, such as building a model bike lane or designing a pedestrian crosswalk.

Evaluating:

Evaluate the effectiveness of transportation and urban planning solutions, considering factors such as accessibility, safety, and environmental impact.

Technical Knowledge:

Gain technical knowledge related to transportation technologies, such as understanding how traffic signals work or how electric vehicles operate, and urban planning principles, such as zoning and land use regulations.

Citizenship / Global Responsibility and Sustainable Development (**SUS11**)

Computing/ Design and Technology

Computer Science:**Coding:**

Understand how coding can be used to develop educational games or simulations that raise awareness about global issues, citizenship, and the Sustainable Development Goals (SDGs).

Algorithms:

Explore algorithms for analysing social data and identifying patterns related to citizenship and global responsibility, such as algorithms for tracking community involvement or for promoting digital citizenship.

Computational Thinking:

Apply computational thinking skills to social and global issues, such as identifying ways technology can be used to address humanitarian challenges or promoting ethical behaviour online.

Information Technology:**Using Software:**

Utilise software tools to research global issues and SDGs, such as using multimedia resources to learn about sustainable development or using online platforms to collaborate on community projects.

Internet Safety:

Learn about internet safety in the context of global citizenship, including understanding how to interact responsibly with others online and

how to protect personal information.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices and online platforms used for global collaboration and advocacy, such as social media platforms, online forums, or virtual meeting tools, and understand their role in promoting global citizenship.

Design and Technology:

Designing:

Design digital or physical products that promote awareness of global issues and encourage active citizenship, such as designing educational apps for creating posters advocating for the SDGs.

Making:

Engage in hands-on making activities to create projects that address global challenges, such as organising a community cleanup or creating artwork that raises awareness about environmental conservation.

Evaluating:

Evaluate the impact of digital tools and technology-based initiatives on promoting global citizenship and achieving SDGs, considering factors such as reach, engagement, and effectiveness.

Technical Knowledge:

Gain technical knowledge related to digital citizenship, online safety, and the use of technology for social good, such as understanding privacy settings, evaluating online sources, and using digital platforms for advocacy and activism.

Outdoor Learning and Connection to Nature (**SUS12**)

Computing/ Design and Technology

Computer Science:

Coding:

Understand how coding can be used to develop interactive nature exploration tools or digital field guides that encourage outdoor learning experiences.

Algorithms:

Explore algorithms for analysing environmental data collected during outdoor activities, such as algorithms for identifying plant species or for tracking animal behaviour.

Computational Thinking:

Apply computational thinking skills to outdoor learning scenarios, such as identifying patterns in nature observations or developing solutions to environmental challenges.

Information Technology:

Using Software:

Utilise software tools to document and analyse outdoor observations, such as using digital cameras or mobile apps to capture images of plants and animals, and using software to organise and analyse data.

Internet Safety:

Learn about internet safety in the context of outdoor learning, including understanding how to safely share and communicate findings with others online.

Digital Literacy:

Understanding Digital Devices:

Identify digital devices used for outdoor learning and nature exploration, such as GPS devices, digital microscopes, or wildlife cameras, and understand their role in collecting and analysing environmental data.

Design and Technology:

Designing:

Design tools or equipment that facilitate outdoor learning experiences, such as designing nature journals or creating digital maps for outdoor exploration.

Making:

Engage in hands-on making activities to create nature-inspired art or crafts using natural materials found outdoors, such as building bird feeders or creating leaf rubbings.

Evaluating:

Evaluate the effectiveness of outdoor learning experiences in fostering nature connectedness and environmental awareness, considering factors such as engagement, curiosity, and appreciation for nature.

Technical Knowledge:

Gain technical knowledge related to outdoor equipment and tools used for nature exploration, such as understanding how to use binoculars or how to interpret GPS coordinates, and develop basic skills for navigating outdoor environments safely.