

## Welsh - Progression 2 Stage

### of a Curriculum For Sustainability Complementing the Welsh Framework



This outline, grounded in the Welsh curriculum, provides a foundation for planning teaching, learning, and experiences that promote sustainability. 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 sustainability-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<br>(including History, Geography, Religion, Values, and Ethics) | Languages, Literacy, and Communication<br>(including Welsh and International Languages) | Mathematics and Numeracy | Science and Technology |
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| <p><b>Expressive Arts</b></p> <p><b>Subject Areas:</b><br/>Music, Drama, Art, Dance, Film and Digital Media.</p> <p><b>Objectives:</b></p> <p>Develop creativity and imagination.</p> <p>Explore a range of media, techniques, and materials.</p> <p>Express ideas and feelings through different artistic forms.</p> <p>Begin to reflect on their own work and that of others.</p> | <p><b>Health and Well-being</b></p> <p><b>Subject Areas:</b><br/>Physical Health, Mental and Emotional Well-being, Relationships, Healthy Eating, Personal Safety.</p> <p><b>Objectives:</b></p> <p>Understand physical health and its connection to well-being.</p> <p>Develop emotional literacy and manage feelings.</p> <p>Learn about making healthy choices (diet, exercise).</p> <p>Build interpersonal skills to foster</p> | <p><b>Humanities</b></p> <p><b>Subject Areas:</b><br/>History, Geography, Religious Education, Business Studies, and Social Studies.</p> <p><b>Objectives:</b></p> <p>Understand past and present human experiences, locally and globally.</p> <p>Develop a sense of belonging and identity.</p> <p>Learn about sustainability and the impact of human actions on the planet.</p> <p>Begin to explore ethical questions and different belief systems.</p> | <p><b>Languages, Literacy and Communication</b></p> <p><b>Subject Areas:</b> English, Welsh, Modern Foreign Languages, Literature, Oracy.</p> <p><b>Objectives:</b></p> <p>Develop competence in both Welsh and English.</p> <p>Explore the use of language for different purposes (e.g., storytelling, explaining, persuading).</p> <p>Learn to communicate effectively through speech and writing.</p> <p>Engage with a range of literary texts, including Welsh literature.</p> | <p><b>Mathematics and Numeracy</b></p> <p><b>Subject Areas:</b><br/>Number, Geometry, Algebra, Measurement, Data Handling.</p> <p><b>Objectives:</b></p> <p>Develop understanding of numbers, patterns, and shapes.</p> <p>Solve practical problems using basic mathematical techniques.</p> <p>Begin to understand and apply mathematical reasoning.</p> <p>Learn to use data to interpret the world around them.</p> | <p><b>Science and Technology</b></p> <p><b>Subject Areas:</b><br/>Biology, Chemistry, Physics, Computer Science, Design and Technology.</p> <p><b>Objectives:</b></p> <p>Begin to explore the natural world and understand simple scientific concepts.</p> <p>Engage with technology and develop basic computational thinking.</p> <p>Design, make, and evaluate simple products and systems.</p> <p>Explore sustainability through understanding energy and material use.</p> |
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|  | positive relationships. |  |  |  |  |
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### The Sustainability Curriculum Headings

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

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

Understanding  
Sustainability

(SUS1)

**Mathematics and Numeracy**

Mathematics and Numeracy AOLE: Understanding Sustainability

**Subject Areas:** Number, Geometry, Algebra, Measurement, Data Handling

**Learning Objectives:**

**Develop Understanding of Numbers, Patterns, and Shapes**

Recognize and create patterns found in nature, such as leaves or shells, to understand how shapes and numbers are part of the natural world.

Explore simple geometric shapes through projects like creating designs using recycled materials, helping learners see connections between maths and sustainable practices.

**Solve Practical Problems Using Basic Mathematical Techniques**

Use addition and subtraction to calculate resources, such as counting materials for a recycling project or estimating the water saved through simple conservation efforts.

Apply basic measurement skills to tasks like measuring waste reduction or comparing amounts of energy saved with eco-friendly actions, reinforcing the real-world value of maths in sustainability.

**Begin to Understand and Apply Mathematical Reasoning**

Identify and describe patterns in data, such as counting the types of materials recycled in a week or the days plants need water, to foster mathematical reasoning with real-world sustainability tasks.

Practise simple reasoning by making predictions based on observations, such as how reducing waste affects the number of items in a recycling bin over time.

**Learn to Use Data to Interpret the World Around Them**

Collect and record basic data on sustainability efforts (e.g., tallying items collected in a litter-pick) and represent it visually in charts or graphs to see the impact of sustainable actions.

Begin to interpret data on topics like local weather patterns or natural resources, helping learners understand how data reflects environmental changes and the importance of sustainability.

Environmental Awareness

(SUS2)

## Mathematics and Numeracy

### Mathematics and Numeracy AOLE: Environmental Awareness

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

**Develop Understanding of Numbers, Patterns, and Shapes**

Identify and describe patterns in nature, such as leaf shapes or animal tracks, using mathematical language to enhance observational skills related to the environment.

Explore geometric shapes in natural forms, such as the symmetry in flowers or the patterns in shells, fostering an appreciation for mathematics in the natural world.

**Solve Practical Problems Using Basic Mathematical Techniques**

Engage in activities that require measuring and calculating, such as determining the area of a garden for planting or calculating how much water is needed for a specific number of plants, linking mathematics to environmental stewardship.

Apply basic addition and subtraction in real-life scenarios, such as tracking waste reduction over a week, reinforcing the importance of sustainable practices.

**Begin to Understand and Apply Mathematical Reasoning**

Discuss and reason about environmental issues using mathematical concepts, such as calculating the carbon footprint of

different activities or the impact of recycling on waste reduction.

Develop simple algorithms or step-by-step approaches to solve environmental challenges, such as creating a plan for a recycling project or reducing energy consumption at school.

### Learn to Use Data to Interpret the World Around Them

Collect and analyse data related to local environmental conditions, such as temperature changes or air quality, using simple graphs or charts to visualise findings.

Interpret data about local wildlife populations or plant growth, drawing conclusions about the health of ecosystems and the impact of human activity, fostering critical thinking about environmental awareness.

Environmental Stewardship

(SUS3)

## Mathematics and Numeracy

### Mathematics and Numeracy AOLE: Earth Stewardship

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

Develop Understanding of Numbers, Patterns, and Shapes

Explore numerical concepts through real-world environmental data, such as calculating carbon footprints or measuring waste reduction, to highlight the impact of human activities on the planet.

Identify and create patterns in nature (e.g., leaf shapes, animal tracks) and use geometric concepts to understand



environmental designs, such as sustainable architecture or garden layouts.

### **Solve Practical Problems Using Basic Mathematical Techniques**

Engage in projects that require problem-solving skills to address local environmental challenges, such as calculating the amount of recyclable materials collected during a community clean-up.

Apply basic arithmetic and measurement skills to design and implement small-scale environmental projects, like creating a garden or recycling program.

### **Begin to Understand and Apply Mathematical Reasoning**

Use reasoning skills to analyse environmental data, such as trends in recycling rates or energy consumption, encouraging learners to draw conclusions and make predictions about future impacts.

Develop strategies for approaching environmental problems mathematically, fostering critical thinking about how numbers and logic can inform decision-making for sustainability.

### **Learn to Use Data to Interpret the World Around Them**

Collect and analyse data related to local environmental conditions, such as air quality or biodiversity, and present findings using graphs and charts to communicate results effectively.

Explore the significance of data in understanding global environmental issues, such as climate change statistics, and discuss how informed decisions can lead to positive changes for the planet.

Waste Management

(SUS4)

**Mathematics and Numeracy**

## **Mathematics and Numeracy AOLE: Waste Management and Circular Earth Resources**

**Subject Areas:** Number, Geometry, Algebra, Measurement, Data Handling

**Learning Objectives:**

### **Develop Understanding of Numbers, Patterns, and Shapes**

Explore numerical data related to waste production and recycling rates, helping learners identify patterns and trends in waste management practices.

Use geometric concepts to design models or diagrams that illustrate the circular economy, emphasising the relationships between materials, resources, and waste.

### **Solve Practical Problems Using Basic Mathematical Techniques**

Apply mathematical techniques to solve real-life problems related to waste management, such as calculating the volume of waste produced in a week or determining the amount of recycled material in a specific project.

Engage learners in budgeting exercises for a recycling project, helping them understand financial aspects related to waste management initiatives.

### **Begin to Understand and Apply Mathematical Reasoning**

Encourage learners to reason through waste-related scenarios, such as determining the most efficient way to reduce waste in their school or community, using logical thinking and mathematical principles.

Introduce basic algebraic concepts to model relationships in waste management, such as formulating equations that represent the reduction of waste through recycling efforts.

### **Learn to Use Data to Interpret the World Around Them**

Collect and analyse data related to local waste management practices (e.g., amounts of recyclable vs. non-recyclable materials), enabling learners to draw conclusions about the effectiveness of these practices.

Use graphs and charts to present data on waste management and circular resources, promoting data literacy and helping

learners communicate their findings effectively.

## Energy Conservation (SUS5)

### Mathematics and Numeracy

#### Mathematics and Numeracy AOLE: Energy Conservation and Energy Alternatives

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

##### Learning Objectives:

##### Develop Understanding of Numbers, Patterns, and Shapes

Recognise and explore patterns related to energy usage (e.g., days of high vs. low energy consumption) and identify trends to support sustainable practices.

Use shapes and spatial awareness to design models of renewable energy sources (e.g., wind turbines, solar panel arrangements), applying geometry to sustainability concepts.

##### Solve Practical Problems Using Basic Mathematical Techniques

Calculate basic energy savings from actions such as turning off lights or reducing water use, linking numeracy skills with real-life conservation scenarios.

Work through simple energy-related word problems, using addition, subtraction, multiplication, and division to find solutions and understand energy efficiency.

##### Begin to Understand and Apply Mathematical Reasoning

Use reasoning to compare energy use data, examining differences in energy consumption before and after implementing

conservation measures.

Develop logical thinking by sequencing steps needed to achieve an energy-saving goal, such as creating a plan to reduce school energy use.

### **Learn to Use Data to Interpret the World Around Them**

Collect, organise, and interpret data on energy use (e.g., classroom lighting or heating habits) and create simple charts to visualise the impact of energy conservation.

Explore how data is used to track and improve energy conservation, discussing how small actions contribute to larger patterns of sustainability.

## **Biodiversity and Ecosystems (SUS6)**

### **Mathematics and Numeracy**

#### **Mathematics and Numeracy AOLE: Biodiversity and Ecosystems**

**Subject Areas:** Number, Geometry, Algebra, Measurement, Data Handling

**Learning Objectives:**

#### **Develop Understanding of Numbers, Patterns, and Shapes**

Identify and describe patterns in nature, such as the symmetry of leaves, the arrangement of petals, or the distribution of animal populations, using numerical data.

Explore geometric shapes found in natural ecosystems, such as the structure of honeycombs or the shapes of animal tracks, to deepen understanding of shapes and their properties.

### **Solve Practical Problems Using Basic Mathematical Techniques**

Apply basic mathematical techniques to calculate the area and perimeter of habitats, such as ponds or forest areas, to understand their size and significance for biodiversity.

Use simple mathematical operations to analyse the growth rates of plant species or populations of animals over time, fostering real-world connections to biodiversity.

### **Begin to Understand and Apply Mathematical Reasoning**

Develop reasoning skills by predicting the impact of environmental changes (e.g., deforestation or pollution) on local biodiversity and using mathematical models to support these predictions.

Explore how mathematical reasoning can help determine the most effective ways to protect and conserve ecosystems, using case studies as examples.

### **Learn to Use Data to Interpret the World Around Them**

Collect and analyse data related to local biodiversity, such as species counts in a given area, using charts and graphs to visualise findings.

Interpret data from surveys or studies on biodiversity (e.g., the number of different species in a habitat) to draw conclusions about ecosystem health and make informed decisions about conservation efforts.

Climate Change and Adaptation

(SUS7)

**Mathematics and Numeracy**

Mathematics and Numeracy AOLE: Climate Change and Adaptation

**Subject Areas:** Number, Geometry, Algebra, Measurement, Data Handling

**Learning Objectives:**

**Develop Understanding of Numbers, Patterns, and Shapes**

Recognise and describe numerical patterns in climate data, such as temperature changes, precipitation levels, and CO<sub>2</sub> emissions over time.

Identify geometric shapes and spatial relationships in maps that represent climate change impacts (e.g., flood zones, coastal erosion areas).

**Solve Practical Problems Using Basic Mathematical Techniques**

Apply basic mathematical techniques to calculate the impact of climate change on local environments, such as estimating changes in sea level or assessing the area of land at risk from flooding.

Solve real-life problems related to climate adaptation, such as budgeting for sustainable projects (e.g., solar panel installation, water conservation systems).

**Begin to Understand and Apply Mathematical Reasoning**

Develop reasoning skills by discussing the mathematical relationships involved in climate models, such as how increased temperatures can affect weather patterns and ecosystems.

Justify mathematical conclusions regarding climate data, demonstrating understanding of concepts like averages, percentages, and rates of change.

**Learn to Use Data to Interpret the World Around Them**

Collect, represent, and analyse data related to climate change effects (e.g., changes in wildlife populations, local weather records) using graphs, charts, and tables.

Interpret data visualisations to communicate findings about climate change trends and propose data-driven solutions for adaptation in Wales and beyond.

Food and Agriculture

(SUS8)

## Mathematics and Numeracy

Learners will explore how **mathematics helps us understand, support, and improve food systems in Wales**, including land farming, aquaculture, and agroforestry. They will apply number, measurement, geometry, and data-handling skills to solve real-world problems, such as tracking crop growth, comparing food production methods, or designing efficient food systems. Learners will begin to see how maths is used to make responsible choices about food, land use, and sustainability.

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### Curriculum for Wales Mathematics and Numeracy Objectives Addressed:

- **Develop understanding of numbers, patterns, and shapes** – by investigating patterns in planting cycles, food webs, or farm layout designs.
- **Solve practical problems using basic mathematical techniques** – such as budgeting for meals, calculating quantities for planting, or estimating harvest yields.
- **Begin to understand and apply mathematical reasoning** – by comparing food production methods or working out which is most sustainable or efficient.
- **Learn to use data to interpret the world around them** – by collecting, representing, and interpreting data on food, seasons, energy, and resources.

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### Global Framework Links:

- **SDG 2: Zero Hunger** – using numeracy to plan for sustainable food access.
- **SDG 12: Responsible Consumption and Production** – interpreting data and applying reasoning to reduce waste and

resource use.

- **UNCRC Article 28** – Right to education that helps children use and apply mathematical thinking.
  - **UNCRC Article 24** – Right to nutritious food and to learn how to care for the environment.
  - **UNRMS Principles** – Encouraging young learners to model resource use, sustainability, and efficiency through mathematical thinking.
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## Examples by Domain:

### Number:

- Calculate the number of seedlings needed to plant in a garden bed or aquaponics unit.
- Work out the cost of a healthy school meal using locally sourced foods and compare prices from different sources.
- Use times tables to estimate harvest times or delivery cycles.

### Geometry:

- Create field or pond maps using basic shapes to show where crops, trees, or shellfish are located.
- Use symmetry and shapes to design agroforestry layouts or food gardens.

### Algebra (early patterns and rules):

- Spot and extend patterns in crop rotations, planting sequences, or weather data.
- Explore “if... then...” rules for food production (e.g., “If one seed grows into 3 plants, how many plants will we have if we plant 4 seeds?”).

### Measurement:

- Measure out soil, water, or ingredients needed to grow or cook a local dish.
- Use scales to weigh harvests or packaging; compare mass and volume of different food types.
- Record temperature, rainfall, or sunlight hours and relate these to plant growth.



## Data Handling:

- Collect and chart data on favourite fruits and vegetables or local vs imported food.
- Interpret simple bar graphs or pictograms showing which foods are grown or caught locally.
- Track changes in food availability or prices across seasons.

Water Conservation

(SUS9)

## Mathematics and Numeracy

### Mathematics and Numeracy AOLE: Food and Agriculture

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

**Develop Understanding of Numbers, Patterns, and Shapes**

Recognize and represent numbers related to agricultural production, such as quantities of food produced or consumed, to develop an understanding of scaling and ratios.

Identify patterns in agricultural data, such as seasonal trends in crop yields or variations in food prices, to enhance numeracy skills and pattern recognition.

**Solve Practical Problems Using Basic Mathematical Techniques**

Apply addition, subtraction, multiplication, and division to solve real-world problems related to food and agriculture, such as

calculating total costs of ingredients or budgeting for a school garden project.

Use measurement skills to estimate areas for planting crops or garden spaces, reinforcing understanding of units of measurement and conversions.

### **Begin to Understand and Apply Mathematical Reasoning**

Develop problem-solving strategies by working on scenarios that involve planning for sustainable food production, such as determining the best planting schedules based on local climate data.

Encourage learners to justify their reasoning when making decisions about resource allocation in agricultural projects, promoting critical thinking and logical reasoning skills.

### **Learn to Use Data to Interpret the World Around Them**

Collect and analyse data related to food consumption patterns, waste generation, or agricultural practices, using graphs and charts to visualise findings and draw conclusions.

Explore how data can be used to track progress towards the Sustainable Development Goals, such as assessing local food security or evaluating the impact of sustainable farming practices on the environment.

## **Mathematics and Numeracy**

### **Mathematics and Numeracy AOLE: Sustainable Transport, Urban Planning, and Building**

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

### **Develop Understanding of Numbers, Patterns, and Shapes**

Identify and represent different geometric shapes and patterns in urban designs (e.g., parks, roads, and buildings) to explore how they contribute to sustainable urban planning.

Use number patterns to understand and calculate traffic flow and congestion in urban areas, encouraging learners to recognize and model real-world scenarios.

### **Solve Practical Problems Using Basic Mathematical Techniques**

Apply mathematical techniques to calculate distances, travel times, and costs associated with various modes of sustainable transport (e.g., walking, cycling, public transport).

Engage in projects where learners design a sustainable community layout, using mathematical problem-solving to address challenges like land use, green spaces, and transport accessibility.

### **Begin to Understand and Apply Mathematical Reasoning**

Use reasoning to compare and evaluate the sustainability of different transport options by analysing costs, environmental impacts, and time efficiencies.

Develop logical arguments to support urban planning decisions, such as the placement of bike lanes or pedestrian pathways, based on mathematical evidence.

### **Learn to Use Data to Interpret the World Around Them**

Collect, analyse, and present data related to local transport usage and urban planning, using charts and graphs to identify trends and make informed decisions.

Explore statistical concepts by investigating the relationships between urban density, transportation options, and carbon emissions, linking findings to global SDGs focused on sustainable cities and communities.

## **Mathematics and Numeracy**

### **Mathematics and Numeracy AOLE: Citizenship, Global Responsibility, and Sustainable Development**

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

#### **Develop Understanding of Numbers, Patterns, and Shapes**

Recognize and use numbers to represent information related to sustainability, such as counting and comparing resources or waste reduction efforts.

Explore patterns found in nature, such as symmetry in plants and animals, helping learners appreciate biodiversity and its importance for the ecosystem.

#### **Solve Practical Problems Using Basic Mathematical Techniques**

Apply simple calculations and measurements to practical scenarios, such as calculating water usage, measuring distances in urban planning activities, or budgeting for sustainable projects.

Work with estimation and basic arithmetic to make decisions about resource use, reinforcing responsible habits for consumption and conservation.

#### **Begin to Understand and Apply Mathematical Reasoning**

Use mathematical reasoning to think through the impact of personal and community actions on the environment, such as reducing waste or conserving energy.

Engage in discussions about fair use of resources, helping learners consider equitable and sustainable solutions in everyday life.

#### **Learn to Use Data to Interpret the World Around Them**

Collect and interpret simple data related to global issues, such as tracking energy usage, recycling rates, or pollution levels, to understand how these factors impact communities locally and globally.

Create and read basic graphs or charts to visualize information about sustainability topics, encouraging learners to make data-driven decisions and recognize trends in environmental responsibility.

## Outdoor Learning and Connection to Nature (SUS12)

### Mathematics and Numeracy

#### Mathematics and Numeracy AOLE: Outdoor Learning, Connectedness with Nature, and Sensory Exploration

Subject Areas: Number, Geometry, Algebra, Measurement, Data Handling

Learning Objectives:

##### Develop Understanding of Numbers, Patterns, and Shapes

Identify and count natural objects found outdoors (e.g., leaves, rocks, petals) to build foundational number skills.

Recognize and describe patterns in nature, such as the symmetry of flowers or shapes of leaves, fostering pattern recognition and geometric awareness.

##### Solve Practical Problems Using Basic Mathematical Techniques

Use measurement skills to explore nature (e.g., measure the height of plants or distance between trees), developing an understanding of size, length, and space.

Estimate and compare quantities of natural items (e.g., how many acorns vs. pinecones) to practise estimation and simple arithmetic in real-world contexts.

### **Begin to Understand and Apply Mathematical Reasoning**

Sort and categorise natural objects by attributes like size, shape, and colour, supporting skills in classification and logical thinking.

Identify simple sequences in nature (e.g., life cycles, stages of plant growth) to develop reasoning about natural processes and timelines.

### **Learn to Use Data to Interpret the World Around Them**

Collect and record outdoor data, such as the number of insects observed or daily weather conditions, introducing basic data collection and tallying.

Create simple charts or graphs with collected data to represent information visually, helping learners understand and interpret data in relation to the natural world.

