

# Unit 31: Understand the Principles of Sustainable Development

<b>Unit code:</b>	<b>R/600/9864</b>
<b>QCF Level 3:</b>	<b>BTEC National</b>
<b>Credit value:</b>	<b>10</b>
<b>Guided learning hours:</b>	<b>60</b>

## ● Aim and purpose

This unit aims to provide learners with an understanding the principles of sustainable development and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

## ● Unit introduction

It is now commonly accepted that there is a great need to ensure that human activities do not cause permanent damage to the environment, thereby denying resources to future generations. Economic and social goals should be achieved in ways that can be supported in the long term by conserving resources, protecting the environment and ensuring human health and welfare. To achieve these, those employed in environment conservation and management should have a knowledge and understanding of the concept of sustainable development and an appreciation of the main mechanisms for its implementation.

This unit gives learners an opportunity to study the core themes and issues of sustainable development. It raises awareness of sustainable issues, responsibility and citizenship, the needs of others both now and in the future, and the requirement to respect and value the diversity of life.

Learners will gain awareness of what is being done globally, nationally and locally to achieve sustainability and how their industry can play a role in achieving these goals.

## ● Learning outcomes

**On completion of this unit a learner should:**

1. Understand the principles of sustainable development
2. Understand resource and environmental management in relation to sustainable development
3. Know how economics and society contribute to sustainable development
4. Understand methods in use to implement sustainable development.

# Unit content

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## 1 Understand the principles of sustainable development

*Definition:* the concept of sustainable development (Brundtland Report, Agenda 21)

*Earth and humans:* Gaia hypothesis; evolution; human population growth; agricultural development; the industrial revolution; resource consumption and pollution; development of local and global transport systems

*Legislation and policies:* development of international conventions and protocols related to sustainable development since the 1970s eg Climate Change Convention, Kyoto Protocol, Copenhagen Accord; methods used to try to ensure countries adhere to the agreed principles eg political pressure, Earth Summits

## 2 Understand resource and environmental management in relation to sustainable development

*Environmental systems:* essential requirements for plant and animal life eg air, water, sunlight, space; basic biogeochemical cycles eg hydrological cycle, carbon cycle; basic population dynamics; food webs; predator/prey relationships; finite (non-renewable) and renewable resources

*State of the environment:* effects of human activities on the environment (air, water, land) eg pollution, use of natural resources, replanting forests; natural environmental changes (catastrophic, gradual); importance of sustaining the wealth of biological diversity (biodiversity) available to humans; current problems affecting biodiversity eg habitat destruction, pollution, invasive species; current biodiversity initiatives and their effectiveness eg UK Biodiversity Action Plan; carrying capacity concept; the concept of resource substitution

*Agriculture, fisheries and forestry:* the challenges of sustainable development; issues relating to feeding a growing population; sustainable farming methods; genetic diversity of crops; issues facing forests in the developing world eg agricultural expansion, overgrazing, commercial logging, deforestation; sustainable forestry eg species diversity, provision of wildlife refuges; issues relating to supplying fish protein to an expanding global human population eg overfishing of wild stocks, marine and freshwater pollution; sustainable aquaculture developments eg choice of species, artificial diet development

## 3 Know how economics and society contribute to sustainable development

*Investment, competition and stability:* importance of the development of skills, lifelong learning and environmental protection; indicators of competitiveness eg availability of human, natural or technological capital; levels of innovation, entrepreneurship and economic stability; adoption and awareness of concepts (eco-efficiency, eco-footprint, recycling, interdependence, preferable futures, uncertainty and precaution)

*Society:* the rights of a citizen and the responsibilities that go with those rights; the impact that activities have on the environment (locally, globally) eg eco-footprint; methods of participation in the local and global community to achieve a more sustainable lifestyle; the roles and responsibilities of government, business, schools, colleges, households and each individual; the difference between 'standard of living' and 'quality of life'; factors that influence the quality of life locally and globally; methods of improving the quality of life locally and globally; the link between actions taken today (consumer choice) and the impact for future generations; methods of reducing impact on the environment and the use of natural resources; reasons for such restraint, why it is necessary and why it matters

#### 4 Understand methods in use to implement sustainable development

*Agenda 21*: the blueprint for sustainability in the 21st century; local and regional promotion for all; the development of societies and economies; conservation and preservation of the environment and natural resources; local Agenda 21 (community involvement, vision statements, action plans); implementation mechanisms

*Sustainable development strategies*: sustainable development as a global issue; the United Nation's Commission on Sustainable Development; UK Sustainable Development Commission; creation of a national strategy on sustainable development eg guiding principles, indicators, agreed priorities; implementation of strategy (UK government sustainable development strategy); implementation mechanisms

## Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P1</b> define the concept of sustainable development	<b>M1</b> discuss how continued growth of the human population globally may impact on demand for global resources	<b>D1</b> evaluate the impact of a given land-based industry on the environment
<b>P2</b> review the Gaia hypothesis and the human, evolutionary and global issues that impact on sustainability [IE]		
<b>P3</b> summarise the global conventions and protocols related to sustainable development		
<b>P4</b> review methods used globally to encourage countries to agree a sustainable policy [IE]		
<b>P5</b> review environmental systems impacting on plant and animal life, including food webs, water and nutrient cycles, population dynamics, use of resources [IE]	<b>M2</b> discuss the potential impact on biodiversity of a given environmental scheme	
<b>P6</b> evaluate the effects of human activities on the environment [IE]		
<b>P7</b> evaluate the integration of sustainable development in agriculture, fisheries and forestry [IE]		

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P8</b> explain how sustainable development is affected by investment, competition and stability	<b>M3</b> discuss the social and economic benefits of a given industry	<b>D2</b> evaluate options for improving a given industry's sustainability.
<b>P9</b> explain the rights and responsibilities of the citizen		
<b>P10</b> discuss the difference between 'standard of living' and 'quality of life'		
<b>P11</b> explain how the behaviour of one generation impacts on the environment for future generations		
<b>P12</b> summarise Agenda 21	<b>M4</b> discuss the development of local Agenda 21.	
<b>P13</b> evaluate the introduction of sustainable development strategies. [IE]		

**PLTS:** This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

<b>Key</b>	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

# Essential guidance for tutors

## Delivery

Tutors delivering this unit have opportunities to use a wide range of delivery methods, including lectures, discussions, seminar presentations, site visits, internet and/or library-based research and personal and/or industrial experience.

It would be beneficial to make learners on work placements and their supervisors aware of the requirements of this unit before any work-related activities are carried out so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to influence consumer choices and reduce environmental impact and they should ask for observation records and/or witness statements to be provided as evidence of this.

Visiting expert speakers could add to the relevance of the subject for learners. For example, a planning officer, consultant or project manager could talk about their perspective on sustainable development, the situations they face and the methods they use.

Whichever delivery methods are used, it is essential that tutors stress the importance of safe working practices and sound environmental management and the need to manage the resource using legal methods.

Health and safety issues relating to field visits must be stressed and reinforced regularly, and risk assessments must be undertaken before any practical activities.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments learners are taking as part of their programme of study.

## Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
<b>Assignment 1: Sustainable Development Poster</b> (P1, P2, P3, P4, P12, M1) Tutor introduces assignment.
Define sustainable development. Introduce the concept of social, environmental and economic factors. Explain about Agenda 21 and key legislation and policies relating to sustainable development including the Kyoto Protocol and Copenhagen Accord. Possible activity for learners to be assigned a country with different priorities and have a mini-conference to try to agree policy.
Introduction of the Gaia hypothesis and discussion on how human population growth has affected resource consumption.
Personal study.
Individual support.

Topic and suggested assignments/activities and/assessment
<b>Assignment 2: Environmental Systems Report</b> (P5, P6, P7, M2)
Tutor introduces assignment.
Introduce environmental systems and how plants and animals interact. Discuss water and nutrient cycles and the difference between renewable and non-renewable resources.
Human impact on the environment.
Discussion on the problems caused by and the challenges facing the agriculture, fisheries and forestry industries.
Personal study.
Individual support.
<b>Assignment 3: Social Presentation</b> (P8, P9, P10, P11, M3, D1, D2)
Tutor introduces assignment.
Impact of investment, competition and stability on sustainable development.
The role of society in sustainable development. What can the individual do?
The role of government, business, colleges and households in sustainable development.
The role of your industry in sustainable development.
<b>Assignment 4: Industry Report</b> (P13, M4)
Tutor introduces assignment.
Personal study.
Individual support.
Introduce different sustainable development strategies.
Local Agenda 21: What is being done locally?
Personal study.
Individual support.
Unit review.

## Assessment

For P1, learners must define the concept of sustainable development. Learners should include the origins of sustainable development in their evidence, which could take the form of an annotated poster, presentation with notes or a written assignment.

For P2, learners are required to review the Gaia hypothesis and the human, evolutionary and global issues that impact on sustainability. Evidence could be in the form of a presentation with notes or a written assignment.

For P3, learners must summarise the global conventions and protocols related to sustainable development. Evidence may be linked to that for other criteria, for example P1. Evidence could take the same form as that for P1.

For P4, learners are required to review methods used globally to encourage countries to agree a sustainable policy. This may be linked to other criteria, for example P3, and evidence could be in the same format as for P3.

For P5, learners are required to review environmental systems impacting on plant and animal life, including food webs, water and nutrient cycles, population dynamics and use of resources. Evidence is likely to take the form of an illustrated report. Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners.

For P6, learners are required to evaluate the effects of human activities on the environment. Tutors should identify and agree with learners the areas of human activity to evaluate. To ensure assessment is fair, the size and complexity of the tasks should be the same for all learners. This may be linked to other criteria, for example P4, and evidence could be in the same form as that for P4.

For P7, learners are required to evaluate the integration of sustainable development in agriculture, fisheries and forestry. Learners should include examples in their evidence, which could be in the same form as that for P5 and linked to P5 and P6.

For P8, learners are required to explain how sustainable development is affected by investment, competition and stability. Learners should include examples in their evidence, which could be in the same form as for P2.

For P9, learners are required to explain the rights and responsibilities of the citizen. Learners should include examples in their evidence, which could be in the same form as for P2 and linked to P8.

For P10, learners are required to discuss the difference between 'standard of living' and 'quality of life'. Learners should include examples in their evidence, which could be in the same form as for P2 and linked to P8.

For P11, learners are required to explain how the behaviour of one generation impacts on the environment for future generations. Learners should include examples in their evidence, which could be in the same form as for P2 and linked to P8.

For P12, learners are required to summarise Agenda 21. Evidence may be linked to that for other criteria, for example P1. Evidence could take the same form as that for P1.

For P13, learners are required to evaluate the introduction of sustainable development strategies. Tutors should identify the strategies or agree them through discussion with learners. It is expected that, as a minimum, learners will provide evidence for at least two different strategies. Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners. Evidence could be in the form of a report.

For M1, learners must discuss how the continued growth of the human population globally may impact on the demand for global resources. Learners should include examples in their evidence, which could be in the same form as for P2 and linked to it.

For M2, learners are required to discuss the potential impact on biodiversity of a given scheme, such as non-native tree planting or wildflower meadow creation. Tutors should identify the scheme or agree it through discussion with learners. Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners. Evidence could be in the form of a report and link to P5.

For M3, learners are required to discuss the social and economic benefits of a given industry. The industry must be agreed with the tutor and is likely to be one of particular interest to the learner. Evidence could take the form of a written assignment or an annotated poster.

For M4, learners must discuss the development of local Agenda 21. In their evidence, learners should include a comment on its use as a mechanism to deal with the problems of poverty, resource consumption and the deterioration of ecosystems. Evidence could be in the same form as for P13.

For D1, learners are required to evaluate the impact of a given industry on the environment. The industry must be agreed with the tutor and is likely to be one of particular interest to the learner. Evidence could take the form of a written assignment or an annotated poster and can link to M3.

For D2, learners are required to evaluate options for improving a given industry's sustainability. Evidence could take the form of a written assignment or an annotated poster and can link to M3.

### **Programme of suggested assignments**

The following table shows a programme of suggested assignments that cover the pass, merit and distinction



criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, P12, M1	Sustainable Development Poster	You work for a Regional Development Agency and are required to create an A3 poster defining sustainable development aimed at college students. It must include a summary of Agenda 21 as well as global conventions and protocols relating to sustainable development.	Poster.
P5, P6, P7, M2	Environmental Systems Report	Produce a report reviewing the environmental systems that impact on plant and animal life. Include an evaluation of the effect of human activities on the environment and the integration of sustainable development in agriculture, fisheries and forestry. Conclude the report by discussing the impact on biodiversity of a given scheme.	Report.
P8, P9, P10, P11, M3, D1, D2	Social Presentation	Produce a presentation for a given audience explaining the Gaia hypothesis and reviewing methods used globally to encourage countries to agree a sustainable policy. Discuss how global resources may be affected by continued population growth. Include how investment, competition and stability affect sustainable development. Explain the rights and responsibilities of the citizen, the difference between 'standard of living' and 'quality of life' and how one generation's acts impact on future generations.	Presentation.
P13, M4	Industry Report	Produce a report evaluating the introduction of sustainable development strategies and how your local Agenda 21 has developed. Discuss how your industry produces social and economic benefits and what impact it has on the environment. Conclude the report by evaluating options your industry could take to improve its sustainability.	Report.

## Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Environmental Studies	Understand and Plan Urban and Community Forestry Projects
Conservation and Improvement of British Habitats	

## Essential resources

Learners will need access to a well-resourced library and quality newspapers. Sustainable development is highly topical and therefore newspaper articles and television/radio news items will provide current information.

Learners will also need access to the internet for research purposes, for example the websites of local authorities, local non-governmental organisations (NGOs) involved with sustainable activities and local Agenda 21. Visits and relevant external speakers will enhance delivery and help keep tutors up to date.

## Employer engagement and vocational contexts

This unit focuses on developing an understanding of the importance of sustainable development. Centres are encouraged to create and develop links with professionals in the local area. This could be through guest lectures or site visits. Linking to industry will ensure that learners appreciate the importance of sustainable development and its value within the industry.

## Indicative reading for learners

### Textbooks

Baker S – *Sustainable Development* (Routledge, 2005) ISBN 9780415282116

Bell S and Morse S – *Sustainability Indicators: Measuring the Immeasurable? 2nd Edition* (Earthscan, 2008) ISBN 9781844072996

Blewitt J – *Understanding Sustainable Development* (Earthscan, 2008) ISBN 9781844074549

DEFRA – *The UK Government Sustainable Development Strategy: Cm. 6467* (Stationery Office Books, 2005) ISBN 0101646720

Dresner S – *The Principles of Sustainability, 2nd Revised Edition* (Earthscan, 2008) ISBN 9781844074969

Elliott J – *An Introduction to Sustainable Development, 3rd Edition* (Routledge, 2005) ISBN 9780415335591

HMSO – *Biodiversity: The UK Action Plan* (Stationery Office Books, 1994) ISBN 9780101242820

Lovelock J – *The Ages of Gaia: A Biography of Our Living Earth, 2nd Edition* (Oxford University Press, 2000) ISBN 9780192862174

Rogers P, Jalal K and Boyd J – *An Introduction to Sustainable Development* (Earthscan, 2007) ISBN 9781844075201

Transport and Regional Affairs Committee Environment – *Better Quality of Life: A Strategy for Sustainable Development for the United Kingdom* (Stationery Office Books, 1999) ISBN 9780101434522

World Commission on Environment and Development – *Our Common Future* (Oxford University Press, 1987) ISBN 9780192820808

## Websites

[www.defra.gov.uk/sustainable/government](http://www.defra.gov.uk/sustainable/government)

[www.esd.rgs.org/index.html](http://www.esd.rgs.org/index.html)

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

[www.rprogress.org/index.htm](http://www.rprogress.org/index.htm)

[www.sd-commission.org.uk](http://www.sd-commission.org.uk)

[www.sd-network.eu](http://www.sd-network.eu)

[www.ukbap.org.uk](http://www.ukbap.org.uk)

[www.un.org](http://www.un.org)

Sustainable Development in Government

Education for Sustainable Development

Environment Agency

Redefining Progress

Sustainable Development Commission

European Sustainable Development Network

UK Biodiversity Action Plan

United Nations

## Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are ...
<b>Independent enquirers</b>	reviewing the Gaia hypothesis and the human, evolutionary and global issues that impact on sustainability reviewing methods used globally to encourage countries to agree a sustainable policy reviewing environmental systems that impact on plant and animal life, including food webs, water and nutrient cycles, population dynamics, use of resources evaluating the effects of human activities on the environment evaluating the integration of sustainable development in agriculture, fisheries and forestry evaluating the introduction of sustainable development strategies.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
<b>Independent enquirers</b>	discussing how continued global human population growth may affect demand for global resources discussing the potential impact on biodiversity of a given scheme evaluating the impact of their industry on the environment
<b>Creative thinkers</b>	evaluating options for improving their industry's sustainability.

## ● Functional Skills – Level 2

Skill	When learners are ...
<b>ICT – Use ICT systems</b>	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed
<b>ICT – Find and select information</b>	
Select and use a variety of sources of information independently for a complex task	researching global conventions and protocols relating to sustainable development
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	researching global conventions and protocols relating to sustainable development
<b>ICT – Develop, present and communicate information</b>	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> <li>• text and tables</li> <li>• images</li> <li>• numbers</li> <li>• records</li> </ul>	<p>producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed</p> <p>producing a presentation explaining the Gaia hypothesis and reviewing methods used globally to encourage countries to agree a sustainable policy</p>
Bring together information to suit content and purpose	<p>producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed</p> <p>producing a presentation explaining the Gaia hypothesis and reviewing methods used globally to encourage countries to agree a sustainable policy</p>
Present information in ways that are fit for purpose and audience	<p>producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed</p> <p>producing a presentation explaining the Gaia hypothesis and reviewing methods used globally to encourage countries to agree a sustainable policy</p>
Evaluate the selection and use of ICT tools and facilities used to present information	producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed
<b>Mathematics</b>	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>
Identify the situation or problem and the mathematical methods needed to tackle it	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>

Skill	When learners are ...
Select and apply a range of skills to find solutions	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>
Use appropriate checking procedures and evaluate their effectiveness at each stage	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>
Draw conclusions and provide mathematical justifications	<p>discussing how continued global human population growth may affect demand for global resources</p> <p>discussing the economic benefits of a given industry and its impact on the environment</p>
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	<p>discussing the potential impact on biodiversity of a given scheme</p> <p>discussing the rights and responsibilities of the citizen, the difference between 'standard of living' and 'quality of life' and how one generation's acts impact on future generations</p> <p>giving a presentation explaining the Gaia hypothesis and reviewing methods used globally to encourage countries to agree a sustainable policy</p>
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching global conventions and protocols relating to sustainable development
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing a report evaluating the introduction of sustainable development strategies and how the local Agenda 21 has developed.