



KS4 Climate Change and Animals Specification Links

Contents

AQA	Pages 1-7
OCR	Pages 7-12
Edexcel	Pages 12-15
WJES EDUQAS	Pages 15-18

AQA GCSE Combined Science: Synergy (September 2016)

Working Scientifically

1 Development of scientific thinking

WS 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

4 Scientific vocabulary, quantities, units, symbols and nomenclature

WS 4.1 Use scientific vocabulary, terminology and definitions.

4.4 Explaining change

4.4.1 The Earth's atmosphere

4.4.1.3 The greenhouse effect

- Describe the greenhouse effect in terms of the interaction of radiation with matter.
- (HT only) Recall that different substances may absorb, transmit or reflect these waves in ways that vary with wavelength.

4.4.1.4 Human impacts on the climate

- Evaluate the evidence for additional anthropogenic causes of climate change, including the correlation between change in atmospheric carbon dioxide concentration and the consumption of fossil fuels

4.4.1.5 Climate change: impacts and mitigation

Describe the potential effects of increased levels of carbon dioxide and methane on the Earth's climate and how these effects may be mitigated, including consideration of scale, risk and environmental implications.

4.4.2 Ecosystems and biodiversity

4.4.2.6 Negative human impacts on ecosystems

- Describe negative human interactions within ecosystems and explain their impact on biodiversity.

AQA GCSE Combined Science: Trilogy (September 2016)

Working Scientifically

1 Development of scientific thinking

WS 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

4 Scientific vocabulary, quantities, units, symbols and nomenclature

WS 4.1 Use scientific vocabulary, terminology and definitions.

4.6 Inheritance, variation and evolution

4.6.3 The development of understanding of genetics and evolution

4.6.3.3 Extinction

Extinctions occur when there are no remaining individuals of a species still alive.

Students should be able to describe factors which may contribute to the extinction of a species.

4.7 Ecology

4.7.3 Biodiversity and the effect of human interaction on ecosystems

4.7.3.1 Biodiversity

The future of the human species on Earth relies on us maintaining a good level of biodiversity. Many human activities are reducing biodiversity and only recently have measures been taken to try to stop this reduction.

4.7.3.4 Deforestation

Large-scale deforestation in tropical areas has occurred.

4.7.3.5 Global warming

Students should be able to describe some of the biological consequences of global warming.

Levels of carbon dioxide and methane in the atmosphere are increasing, and contribute to 'global warming'.

4.7.3.6 Maintaining biodiversity

Students should be able to describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity.

5.9 Chemistry of the atmosphere

5.9.2 Carbon dioxide and methane as greenhouse gases

5.9.2.1 Greenhouse gases

Greenhouse gases in the atmosphere maintain temperatures on Earth high enough to support life. Water vapour, carbon dioxide and methane are greenhouse gases.

Students should be able to describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter.

5.9.2.2 Human activities which contribute to an increase in greenhouse gases in the atmosphere

Some human activities increase the amounts of greenhouse gases in the atmosphere. These include:

- carbon dioxide
- methane.

Students should be able to recall two human activities that increase the amounts of each of the greenhouse gases carbon dioxide and methane.

Based on peer-reviewed evidence, many scientists believe that human activities will cause the temperature of the Earth's atmosphere to increase at the surface and that this will result in global climate change.

5.9.2.3 Global climate change

An increase in average global temperature is a major cause of climate change.

There are several potential effects of global climate change.

Students should be able to:

- describe briefly four potential effects of global climate change
- discuss the scale, risk and environmental implications of global climate change.

5.9.2.4 The carbon footprint and its reduction

The carbon footprint is the total amount of carbon dioxide and other greenhouse gases emitted over the full life cycle of a product, service or event.

The carbon footprint can be reduced by reducing emissions of carbon dioxide and methane.

Students should be able to:

- describe actions to reduce emissions of carbon dioxide and methane.

AQA GCSE Biology (September 2016)

Working Scientifically

1 Development of scientific thinking

WS 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

4 Scientific vocabulary, quantities, units, symbols and nomenclature

WS 4.1 Use scientific vocabulary, terminology and definitions.

4.6. Inheritance, variation and evolution

4.6.3 The development of understanding of genetics and evolution

4.6.3.6 Extinction

Extinctions occur when there are no remaining individuals of a species still alive.

Students should be able to describe factors which may contribute to the extinction of a species.

4.7 Ecology

4.7.2 Organisation of an ecosystem

4.7.2.3 Decomposition (biology only)

Anaerobic decay produces methane gas.

4.7.2.4 Impact of environmental change (biology only) (HT only)

Students should be able to evaluate the impact of environmental changes on the distribution of species in an ecosystem given appropriate information.

4.7.3 Biodiversity and the effect of human interaction on ecosystems

4.7.3.1 Biodiversity

The future of the human species on Earth relies on us maintaining a good level of biodiversity. Many human activities are reducing biodiversity and only recently have measures been taken to try to stop this reduction.

4.7.3.4 Deforestation

Large-scale deforestation in tropical areas has occurred.

4.7.3.5 Global warming

Students should be able to describe some of the biological consequences of global warming.

Levels of carbon dioxide and methane in the atmosphere are increasing, and contribute to 'global warming'.

4.7.3.6 Maintaining biodiversity

Students should be able to describe negative human interactions in an ecosystem and explain their impact on biodiversity.

Scientists and concerned citizens have put in place programmes to reduce the negative effects of humans on ecosystems and biodiversity.

These include:

- recycling resources rather than dumping waste in landfill.

AQA GCSE Geography

3.1 Living with the physical environment

3.1.1 Section A: The challenge of natural hazards

3.1.1.3 Weather hazards

The UK is affected by a number of weather hazards.

3.1.1.4 Climate change

Climate change is the result of natural and human factors, and has a range of effects.

Managing climate change involves both mitigation (reducing causes) and adaptation (responding to change).

3.1.2 Section B: The living world

3.1.2.2 Tropical rainforests

Deforestation has environmental impacts.

3.1.2.4 Cold environments

Cold environments (tundra) have a range of distinctive characteristics.

3.2.3 Section C: The challenge of resource management

Different strategies can be used to increase energy supply.

AQA GCSE Chemistry

4.9 Chemistry of the atmosphere

4.9.1 The composition and evolution of the Earth's atmosphere

4.9.2 Carbon dioxide and methane as greenhouse gases

4.9.2.1 Greenhouse gases

Greenhouse gases in the atmosphere maintain temperatures on Earth high enough to support life. Water vapour, carbon dioxide and methane are greenhouse gases.

4.9.2.2 Human activities which contribute to an increase in greenhouse gases in the atmosphere

Some human activities increase the amounts of greenhouse gases in the atmosphere. These include:

- carbon dioxide
- methane.

Students should be able to recall two human activities that increase the amounts of each of the greenhouse gases carbon dioxide and methane.

Based on peer-reviewed evidence, many scientists believe that human activities will cause the temperature of the Earth's atmosphere to increase at the surface and that this will result in global climate change.

4.9.2.3 Global climate change

An increase in average global temperature is a major cause of climate change. There are several potential effects of global climate change. Students should be able to:

- describe briefly four potential effects of global climate change
- discuss the scale, risk and environmental implications of global climate change.

4.9.2.4 The carbon footprint and its reduction

The carbon footprint is the total amount of carbon dioxide and other greenhouse gases emitted over the full life cycle of a product, service or event. The carbon footprint can be reduced by reducing emissions of carbon dioxide and methane. Students should be able to:

- describe actions to reduce emissions of carbon dioxide and methane



4.10 Using resources

4.10.1 Using the Earth's resources and obtaining potable water

4.10.1.1 Using the Earth's resources and sustainable development

Humans use the Earth's resources to provide warmth, shelter, food and transport.

4.10.2 Life cycle assessment and recycling

4.10.2.2 Ways of reducing the use of resources

The reduction in use, reuse and recycling of materials by end users reduces the use of limited resources, use of energy sources, waste and environmental impacts.

Metals, glass, building materials, clay ceramics and most plastics are produced from limited raw materials. Much of the energy for the processes comes from limited resources. Obtaining raw materials from the Earth by quarrying and mining causes environmental impacts

OCR Science Combined A (from September 2016)

Working scientifically

WS1.1 Development of scientific thinking

WS1.1e explain everyday and technological applications of science

WS1.1f evaluate associated personal, social, economic and environmental implications

WS1.3f presenting reasoned explanations

WS1.4a use scientific vocabulary, terminology and definitions

Topic B6: Global challenges

6.1 Monitoring and maintaining the environment

B6.1b describe negative human interactions within ecosystems and explain their impact on biodiversity

Topic C6: Global challenges

C6.2 Interpreting and interacting with earth systems

C6.2c describe the greenhouse effect in terms of the interaction of radiation with matter within the atmosphere



C6.2d evaluate the evidence for additional anthropogenic (human activity) causes of climate change

C6.2e describe the potential effects of increased levels of carbon dioxide and methane on the Earth's climate and how these effects may be mitigated

OCR Science Combined B (from September 2016)

Chapter BCP7: Ideas about Science

laS2 What conclusions can we make from data?

laS4 How do science and technology impact society?

Chapter B6: Life on Earth – past, present and future

B6.3 Why is biodiversity threatened and how can we protect it?

Chapter C1: Air and water

C1.3 What is the evidence for climate change, why is it occurring?

Chapter P1: Radiation and waves

P1.2 What is climate change and what is the evidence for it?

Chapter BCP7: Ideas about Science

laS3 How are scientific explanations developed?

2. describe and explain examples of scientific methods and theories that have developed over time and how theories have been modified when new evidence became available

OCR Gateway Science Biology A – For first assessment in 2018

Working scientifically

WS1.1e explain everyday and technological applications of science

WS1.1f evaluate associated personal, social, economic and environmental implications

WS1.1g make decisions based on the evaluation of evidence and arguments

WS1.3f presenting reasoned explanations

WS1.4a use scientific vocabulary, terminology and definitions

Topic B6 – Global Challenges

B6.1 – Monitoring and maintaining the environment

B6.1b describe negative human interactions within ecosystems and explain their impact on biodiversity

B6.1d evaluate the evidence for the impact of environmental changes on the distribution of organisms, with reference to atmospheric gases

OCR Twenty First Century Science Biology B – For first assessment in 2018

Chapter B7: Ideas about Science

1aS2 What conclusions can we make from data?

1aS4 How do science and technology impact society?

B6.4 How is biodiversity threatened and how can we protect it?

OCR Geography A (Geographical Themes) – For first assessment in 2018

2c. Content of Living in the UK Today (J383/01)

1.3 UK Environmental Challenge

1.3.2 Extreme flood hazard events are becoming more commonplace in the UK.

1.3.3 Humans use, modify and change ecosystems and environments to obtain food, energy and water.

2.3 Environmental threats to our Planet

2.3.1 The climate has changed from the start of the Quaternary period.

- Overview of how the climate has changed from the beginning of the Quaternary period to the present day, including ice ages.
- Evidence for climate change over different time periods, including global temperature data, ice cores, tree rings, paintings and diaries.

2.3.2 There are a number of possible causes of climate change.

- How human activity is responsible for the enhanced greenhouse effect which contributes to global warming.

2.3.3 Climate change has consequences.

- Summary of a range of consequences of climate change currently being experienced across the planet.

2.3.5 Extreme weather conditions cause different natural weather hazards.

- Outline the causes of the extreme weather conditions that are associated with the hazards of tropical storms and drought.
- The distribution and frequency of tropical storms and drought, and whether these have changed over time.

OCR Geography B (Geography for Enquiring Minds) – For first assessment in 2018

2c. Content of Our Natural World (J384/01)

Topic 2 – Changing Climate

2.1. What evidence is there to suggest climate change is a natural process?

- What evidence is there for climate change?
- Is climate change a natural process?
- Why is climate change a global issue?

Topic 4: Sustaining Ecosystems

4.2. Why should tropical rainforests matter to us?

- What biodiversity exists in tropical rainforests?
- Why are tropical rainforests being 'exploited'?

4.3. Is there more to polar environments than ice?

- What is it like in the Arctic?



OCR Gateway Science Chemistry A

Working scientifically

WS1.1e explain everyday and technological applications of science

WS1.1f evaluate associated personal, social, economic and environmental implications

WS1.1g make decisions based on the evaluation of evidence and arguments

WS1.3f presenting reasoned explanations

WS1.4a use scientific vocabulary, terminology and definitions

Topic C6: Global challenges

C6.3 Interpreting and interacting with earth systems

C6.3c describe the greenhouse effect in terms of the interaction of radiation with matter within the atmosphere

C6.3d evaluate the evidence for additional anthropogenic (human activity) causes of climate change and describe the uncertainties in the evidence base

C6.3e describe the potential effects of increased levels of carbon dioxide and methane on the Earth's climate and how these effects may be mitigated

OCR Twenty First Century Science Chemistry B

Chapter C7: Ideas about science

laS2 What conclusions can we make from data?

laS4 How do science and technology impact society?

Chapter C1: Air and water

C1.1 How has the Earth's atmosphere changed over time, and why?

Our modern lifestyle has created a high demand for energy. Combustion of fossil fuels for transport and energy generation leads to emissions of pollutants.

C1.3 What is the evidence for climate change, why is it occurring?

1. describe the greenhouse effect in terms of the interaction of radiation with matter



2. evaluate the evidence for additional anthropogenic causes of climate change, including the correlation between change in atmospheric carbon dioxide concentration and the consumption of fossil fuels, and describe the uncertainties in the evidence base
3. describe the potential effects of increased levels of carbon dioxide and methane on the Earth's climate, including where crops can be grown, extreme weather patterns, melting of polar ice and flooding of low land
4. describe how the effects of increased levels of carbon dioxide and methane may be mitigated, including consideration of scale, risk and environmental implications

Edexcel GCSE Combined Science from 2016

Working scientifically

1 Development of scientific thinking

d Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

2 Experimental skills and strategies

a Use scientific theories and explanations to develop hypotheses.

3 Analysis and evaluation

f Presenting reasoned explanations including relating data to hypotheses

4 Scientific vocabulary, quantities, units, symbols and nomenclature

a Use scientific vocabulary, terminology and definitions.

Chemistry

Topic 8 – Fuels and Earth science

Earth and atmospheric science

8.24 Describe how various gases in the atmosphere, including carbon dioxide, methane and water vapour, absorb heat radiated from the Earth, subsequently releasing energy which keeps the Earth warm: this is known as the greenhouse effect

8.25 Evaluate the evidence for human activity causing climate change, considering:

a. the correlation between the change in atmospheric carbon dioxide concentration, the consumption of fossil fuels and temperature change

8.26 Describe: a. the potential effects on the climate of increased levels of carbon dioxide and methane generated by human activity, including burning fossil fuels and livestock farming

b. that these effects may be mitigated: consider scale, risk and environmental implications

Edexcel GCSE Biology from 2016

Working scientifically

1 Development of scientific thinking

d Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

2 Experimental skills and strategies

a Use scientific theories and explanations to develop hypotheses.

3 Analysis and evaluation

f Presenting reasoned explanations including relating data to hypotheses

4 Scientific vocabulary, quantities, units, symbols and nomenclature

a Use scientific vocabulary, terminology and definitions.

Topic 9 – Ecosystems and material cycles

9.2 Explain how communities can be affected by abiotic and biotic factors, including: temperature.

9.9 Explain the negative human interactions within ecosystems and their impacts on biodiversity.

Edexcel GCSE Chemistry from 2016

Working scientifically

1 Development of scientific thinking

d Explain every day and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.

2 Experimental skills and strategies

a Use scientific theories and explanations to develop hypotheses.

3 Analysis and evaluation

f Presenting reasoned explanations including relating data to hypotheses

4 Scientific vocabulary, quantities, units, symbols and nomenclature

a Use scientific vocabulary, terminology and definitions.

Topic 4 – Extracting metals and equilibria

Obtaining and using metals

4.10 Evaluate the advantages of recycling metals, including how recycling can preserve both the environment and the supply of valuable raw materials

Topic 8 – Fuels and Earth science

Earth and atmospheric science

8.24 Describe how various gases in the atmosphere, including carbon dioxide, methane and water vapour, absorb heat radiated from the Earth, subsequently releasing energy which keeps the Earth warm: this is known as the greenhouse effect.

8.25 Evaluate the evidence for human activity causing climate change, considering: a) the correlation between the change in atmospheric carbon dioxide concentration, the consumption of fossil fuels and temperature change.

8.26 Describe: a) the potential effects on the climate of increased levels of carbon dioxide and methane generated by human activity, including burning fossil fuels and livestock farming; b) that these effects may be mitigated: consider scale, risk and environmental implications.

Edexcel GCSE Geography A from 2016

Topic 2: Weather hazards and climate change

2.2 The global climate was different in the past and continues to change due to natural causes.

2.3 Global climate is now changing as a result of human activity.

Topic 3: Ecosystems, biodiversity and management

3.2 The biosphere is a vital system.

3.5 Tropical rainforest ecosystems provide a range of goods and services some of which are under threat.

Topic 6: Resource management

6.1 A natural resource is any feature or part of the environment that can be used to meet human needs.

Optional sub topic 6A: Energy resource management

6.5 There is increasing demand for energy that is being met by renewable and non-renewable resources

Edexcel GCSE Geography B from 2016

Topic 1: Hazardous Earth

1.3 Global climate is now changing as a result of human activity, and there is uncertainty about future climates

Topic 2: Development dynamics

Topic 4: The UK's evolving physical landscape

Sub topic: Coastal change and conflict

4.5 The interaction of human and physical processes present challenges along coastlines and there are a variety of management options

Topic 8: Forests under threat

8.3 Tropical rainforests are threatened directly by deforestation and indirectly by climate change

Topic 9: Consuming energy resources

9.1 Energy resources can be classified in different ways and their extraction and use has environmental consequences

9.5 Reducing reliance on fossil fuels presents major technical challenges

WJES EDUQAS GCSE Biology (from 2016)

Working scientifically

1. Development of scientific thinking

- explain every day and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments

2. Experimental skills and strategies

- use scientific theories and explanations to develop hypotheses

3. Analysis and evaluation

- presenting reasoned explanations including relating data to hypotheses

4. Scientific vocabulary, quantities, units, symbols and nomenclature

- use scientific vocabulary, terminology and definitions

6 Ecosystems

6.1 Levels of organisation within an ecosystem

(b) explain how some abiotic factors affect communities as exemplified by temperature

6.2 The Principle of material cycling

(c) Burning fossil fuels releases carbon dioxide

(f) evaluate the evidence for the impact of environmental changes on the distribution of organisms, with reference to atmospheric gases

6.3 Biodiversity

(e) describe both negative human interactions within ecosystems and explain their impact on biodiversity

(h) explain some of the benefits of maintaining local and global biodiversity

WJES EDUQAS GCSE Chemistry (from 2016)

Working scientifically

1. Development of scientific thinking

- explain every day and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments

2. Experimental skills and strategies

- use scientific theories and explanations to develop hypotheses

3. Analysis and evaluation

- presenting reasoned explanations including relating data to hypotheses

4. Scientific vocabulary, quantities, units, symbols and nomenclature

- use scientific vocabulary, terminology and definitions

12. The Earth and its Atmosphere

(d) describe the greenhouse effect in terms of the interaction of radiation with the Earth's atmosphere

(e) explain global warming in terms of an 'enhanced greenhouse effect'



(f) evaluate the evidence for man-made causes of climate change, including the correlation between change in atmospheric carbon dioxide concentration and the consumption of fossil fuels, and describe the uncertainties in the evidence base

(g) describe the potential effects of increased levels of carbon dioxide and methane on the Earth's climate and how these may be mitigated, including consideration of scale, risk and environmental implications

WJES EDUQAS GCSE Geography A (from 2016)

Core Theme 5: Weather, Climate and Ecosystems

Key Idea 5.1: Climate change during the Quaternary period

5.1.1 What is the evidence for climate change?

5.1.2 What are the causes of climate change?

Key Idea 5.2: Weather patterns and process

5.2.2 What factors create variations in weather and climate at different scales within the UK?

Key Idea 5.4: Human activity and ecosystem processes

5.4.1 How do people use ecosystems and environments?

5.4.2 How do human activities modify processes and interactions within ecosystems?

Theme 8: Environmental Challenges

Key Idea 8.1: Consumerism and its impact on the environment

8.1.1 What are the impacts of increasing consumer choice on the global environment?

8.1.2 How may climate change affect people and how people's lifestyles changed to reduce these impacts?

WJES EDUQAS GCSE Geography B (from 2016)

Theme 2: Changing Environments

Key Idea 2.4: Climate change - cause and effect

2.4.2 What are the causes of global warming?

2.4.3 What are the consequences of climate change?



2.4.4 How and why do attitudes to climate change vary?

2.4.5 What role can individuals and government in the UK play in reducing the risk of climate change?

Theme 3: Environmental Challenges

Key Idea 3.2: Ecosystems under threat

3.2.1 How are ecosystems used by people?