

Chapter 1 What a wonderful world

Introduction

Learning intentions

By the end of this lesson pupils will:

- ▶ have considered the beauty of the Earth

Key elements

Spiritual understanding

Cross-curricular skills

Communication

Using ICT

Thinking skills and personal capabilities

- ▶ Give and respond to feedback



Lesson plan

Starter

Ask each pupil to think of two words that begin with the first letter of their name and which they could use to describe the beauty of the world. For example:

- ▶ Orla – outrageous orangutans
- ▶ Mark – marvellous mountains
- ▶ Paul – proud ponies
- ▶ Sara – shining stars.

Development

- ▶ Ask the class to listen to the song *What a wonderful world*. This is widely available, including on iTunes, in many different versions. As they listen they should write down five things that the song states are wonderful about the world.
- ▶ Complete the Discuss tasks on page 1 of the textbook.

Plenary

- ▶ Each group reads their song to the class. The other groups use the score cards on Worksheet 1.1, page 3, to give each group a mark out of ten and a reason for their mark. The marks are recorded on the board and the group with the highest marks wins.

Homework suggestion

Design a poster that illustrates how wonderful the world is.

Extension activity

Pupils could create a PowerPoint® display to accompany their song. Some might like to try setting their song to music.

Learning outcomes

- ▶ Demonstrate creativity and initiative when developing ideas and following them through.

Worksheet 1.1

Score card

	Name of song	Score out of 10	Comments
Group 1			
Group 2			
Group 3			
Group 4			
Group 5			
Group 6			
Group 7			
Group 8			

Chapter 1 What a wonderful world

Creation stories

Learning intentions

By the end of this lesson pupils will:

- ▶ have considered the question 'How did the world begin?'
- ▶ have begun to understand that science and religion answer this question in different ways
- ▶ have begun to evaluate their own opinions as to how the world began

Key elements

Spiritual awareness

Cross-curricular skills

Communication

Using mathematics

Thinking skills and personal capabilities

- ▶ Examine options, weigh up pros and cons
- ▶ Listen actively and share opinions



Lesson plan

Starter

- ▶ Show pupils a PowerPoint® presentation of images of the natural world in all its splendour. Include landscapes, animals, faces, etc. Show this while playing the song *What a wonderful world*. Ask pupils to think about what the images tell us about the world we live in.

Or

- ▶ Read aloud to pupils the visualisation on Worksheet 1.2, page 6. This guided visualisation can help us to reflect upon the beauty of the world. Take plenty of time to talk through this visualisation in order for it to be most effective.

Development

- ▶ Read 'Creation stories' in the textbook (pages 2–3).
- ▶ Complete Get Active 1.
- ▶ Discuss with the class that there are many different theories about how the world was created. Explain that even within Christianity there is a wide opinion of belief. Discuss the beliefs that are outlined on Worksheet 1.3, page 7, with the class.
- ▶ Complete the Creation/Evolution activities on Worksheets 1.3–1.5, pages 7–10. Give students Worksheet 1.3 to introduce the task. Place around the room the six statements from Worksheet 1.4 giving people's explanations for life and the universe. Pupils read each statement carefully and decide which one they agree with most and why. Each pupil writes his/her reason on a sticky-note and puts it beside the statement. Pupils read the statements again and decide which one they disagree with most and why. Each pupil writes his/her reason on a different coloured sticky-note and puts it beside the statement. Once this is completed, each statement with the sticky-notes is brought up to the front of the room and put on the board. The class can discuss the most popular and unpopular beliefs. This discussion can be recorded on Worksheet 1.5, with pupils noting how many people agree or disagree with each statement in the columns provided.

Plenary

- ▶ Complete Worksheet 1.5. Conclude the lesson by stating that each statement is a belief and none of them can be proven.

Homework suggestion

Imagine you live in a tribe in the jungle. You have no scientific knowledge but the tribe has a story that answers the question 'Where did the world come from?' Write down what that story would be.

Extension activity

Complete the research activity on Charles Darwin on Worksheet 1.6, page 11.

Learning outcomes

- ▶ Show deeper understanding by thinking critically and flexibly.

Worksheet 1.2

Visualisation

- ▶ Close your eyes. Make sure that you are sitting comfortably in your chair. Allow your body to relax.
- ▶ Listen to your breathing.
- ▶ Try to forget about what you've been doing today – the things you have to do tonight, the homework you've forgotten, what you're going to have for dinner. Think only of your breathing. Breathe in deeply ... and exhale fully.
- ▶ As you continue to sit comfortably, try to visualise a mountain range in front of you. The mountains stretch high into the sky with glistening snow-covered peaks. The sky is a beautiful blue and a few fluffy clouds float above your head. You turn slowly around, breathing in the fresh clean air and a lake is before you with a wood on either side. A path leads you into the wood. As you enter, the sound of bird song fills the air. Sunlight filters through the trees, casting dancing shadows on the ground as the leaves rustle in the breeze. There is a clearing where the sun shines dazzlingly on a brightly coloured selection of flowers, each swaying in the breeze.
- ▶ You walk along the path and hear the sound of a river as it tumbles through the woods. You follow the path that leads you down to the river and fish can be clearly seen chasing each other around the rocks. A bird dives into the water, the vivid blue and green of its feathers intensified by the sunlight and water; it emerges with a fish in its beak. You walk beside the river, watching the dragonflies hover over it and then dart away. The wood begins to thin out and you find yourself looking at a golden beach with the sea sparkling as the sun begins to set. You breathe deeply, savouring the smell of the salt sea air and enjoying the gentle breeze on your face. You watch the sun set on the horizon, changing the colour of the sky to reds, pinks and purples.
- ▶ As the sky darkens you watch as the stars appear. First one, then another. The sky begins to fill with stars and the moon rises, casting a silvery glow over the sea. You lie down on the sand and watch the stars twinkling high above you. You breathe deeply and become aware once more of your breathing. Listen to your breathing.
- ▶ When you are ready, relax a little but keep your eyes closed. Take a few more deep breaths – open your eyes.

Worksheet 1.3

Creation and science

Creation

Creation is the belief that a creative power called God made the universe and all the variety of life forms living on the Earth.

Scientific explanations

Scientific explanations state that the universe came about through a large explosion. All the matter in the universe was concentrated into a hot ball; this exploded and the matter flew apart. Over a period of millions of years this eventually cooled, forming the first atoms, then gases and eventually galaxies.

Life formed on Earth through small molecules being subjected to incredible heat which in turn led to the formation of other molecules important to life. These molecules went through a series of accidents which led to the formation of a cell that could reproduce itself. Everything that is alive today is descended from this first living cell.

Important to this theory is the process of mutation and natural selection. Mutation is when cells within a living organism change in some way. When the organism reproduces, the change may be passed on. For example, cells may change within the ear of a wild animal, making it a better hunter and therefore healthier than the rest of its kind. Eventually, over a period of time, the wild animal with the better hearing will replace the other type whose hearing was not as good. This is called natural selection.

Task

- 1 There are six statements around the room outlining what some people believe. Read each statement carefully and decide which statement you most agree with. Write your reason on a sticky-note and put it beside the statement.
- 2 Read the statements again and decide which one you disagree with most and why. Write your reason on a different coloured sticky-note and put it beside the statement.
- 3 Once everyone has done this, the class can discuss the most popular and unpopular beliefs.

Worksheet 1.4

Statement 1

It says in the Bible that God created the world in six days and therefore that is how it happened. The Bible is always correct.

Statement 2

Each day in the Bible represents a period of time in which life developed. Each day could represent millions of years.

Statement 3

The Bible's account of how the world was created doesn't make sense. However, a Supreme Being did create all living things.

Worksheet 1.4 *continued*

Statement 4

The universe, the Earth and all living things came about through the process of evolution. There was no 'Supreme Being' involved.

Statement 5

The world came into existence through the process of development. However, mutation and natural selection could not produce the enormous changes needed to change apes into humans or fish into amphibians.

Statement 6

God created the world using the process of evolution. The creation story answers the question, 'Who made the world?' The theory of evolution answers the question, 'How was it done?'

Worksheet 1.5

Creation and science: explanations for life and the universe – record sheet

1 Complete the table by recording the class results beside each statement.

	Agree	Disagree
<p>Statement 1 It says in the Bible that God created the world in six days and therefore that is how it happened. The Bible is always correct.</p>		
<p>Statement 2 Each day in the Bible represents a period of time in which life developed. Each day could represent millions of years.</p>		
<p>Statement 3 The Bible’s account of how the world was created doesn’t make sense. However, a Supreme Being did create all living things.</p>		
<p>Statement 4 The universe, the Earth and all living things came about through the process of evolution. There was no ‘Supreme Being’ involved.</p>		
<p>Statement 5 The world came into existence through the process of development. However, mutation and natural selection could not produce the enormous changes needed to change apes into humans or fish into amphibians.</p>		
<p>Statement 6 God created the world using the process of evolution. The creation story answers the question, ‘Who made the world?’ The theory of evolution answers the question, ‘How was it done?’</p>		

2 Now create a bar chart to show your results.

Worksheet 1.6

Research Charles Darwin

1 Select a search engine and type in *Charles Darwin*. Use the information that you find to complete this information sheet.

Full name: _____

Date of birth: _____

Date of death: _____

Education: _____

Job: _____

Name of wife: _____

Names of children: _____

2 Explain the theory of evolution and natural selection.

3 Select five more interesting facts about Charles Darwin and record them here.

1 _____

2 _____

3 _____

4 _____

5 _____

Chapter 1 What a wonderful world

What do the creation stories mean?

Learning intentions

By the end of this lesson pupils will:

- ▶ understand that most religious people believe that they have a responsibility to look after the world
- ▶ have explored ways that individual people can change their lives to make the world a better place

Key elements

Citizenship

Cross-curricular skills

Communication

Thinking skills and personal capabilities

- ▶ Working with others
- ▶ Listen actively and share opinions



Lesson plan

Starter

- ▶ Play a game of 'jeopardy' with pupils working in groups. Ask the pupils to write down two questions and the answers based on the creation stories that they read during the last lesson. Collect the questions and answers and read out the answers to the class. Ask the groups to write down the questions they think match the answers. The groups then swap the questions that they have written to the answers the teacher read out. Read out the answers followed by the correctly matched question. Award two points for each correctly given question. If a group has given a different question but the answer is still correct then award one point. A prize could be given to the winning team.
- ▶ Read the first part of 'What do the creation stories mean?', page 4 of the textbook, and complete Get Active 1.

Development

- ▶ Ask pupils to read the second part of 'What do the creation stories mean?'
- ▶ In groups, using the website www.wearewhatwedo.org, ask pupils to create a questionnaire that asks people what they do to make the world a better place. Encourage groups to come up with ten questions.
- ▶ Complete Get Active 2.

Plenary

- ▶ Complete the self/peer evaluation sheet (Worksheet 1.7, page 14) based on the work done in Get Active 2. Ask each pupil to complete a self evaluation and then an evaluation of one other member of their group. The pupils compare the evaluations of themselves with the ones completed by their classmates. If the evaluations are very different the pupils can discuss the decisions that they made and why.

Homework suggestion

Each pupil is to ask ten people to complete their questionnaire.

Extension activity

Posters advertising TV or radio campaigns are frequently placed on the sides and backs of buses. Ask pupils to design a poster relating to the advert they created for the radio.

Learning outcomes

- ▶ To work effectively with others.

Worksheet 1.7

Self Evaluation

Name _____

How well did you participate in this group activity?

Circle the number that best describes you. 1 = excellent ... 5 = poor

- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Deciding on the topic for the advert. | 1 | 2 | 3 | 4 | 5 |
| 2 | The script writing. | 1 | 2 | 3 | 4 | 5 |
| 3 | Performing the advert. | 1 | 2 | 3 | 4 | 5 |
| 4 | How well did you work within this group? | 1 | 2 | 3 | 4 | 5 |
| 5 | How would you rate the group's performance? | 1 | 2 | 3 | 4 | 5 |

Peer Evaluation

Name _____

How well did they participate in this group activity?

Circle the number that best describes them. 1 = excellent ... 5 = poor

- | | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Deciding on the topic for the advert. | 1 | 2 | 3 | 4 | 5 |
| 2 | The script writing. | 1 | 2 | 3 | 4 | 5 |
| 3 | Performing the advert. | 1 | 2 | 3 | 4 | 5 |
| 4 | How well did they work within this group? | 1 | 2 | 3 | 4 | 5 |
| 5 | How would you rate the group's performance? | 1 | 2 | 3 | 4 | 5 |

Chapter 1 What a wonderful world

A planet under pressure

Learning intentions

By the end of this lesson pupils will:

- ▶ have knowledge of various ways in which the Earth is being destroyed
- ▶ understand why people choose to act towards the Earth as they do
- ▶ have identified ways in which individuals can help to improve the environment

Key elements

Education for sustainable development

Cross-curricular skills

Communication
Using mathematics

Thinking skills and personal capabilities

- ▶ Use a range of methods for collating, recording and representing information



Lesson plan

Starter

- ▶ Pupils complete Get Active 1 on textbook page 6. They imagine that they are God's special agents on Earth and complete the mission that he has set them.
- ▶ Discuss the displays that the pupils have created and the reason why they believe humans treat the Earth in this fashion.

Development

- ▶ Pupils are to think about what sort of media campaign they would create if they were trying to get people to change their attitudes towards the Earth. What media would they use: TV, posters, radio commercials, magazines, the internet? Perhaps all of them. What would they say? What logo would they have?
- ▶ Using the results from the questionnaire pupils completed for homework on page 13, they could decide on an area that needs to be improved and focus their campaign upon that. All their ideas need to come together on a ‘thought board’ that explains what they would plan to do – this could simply be a piece of A3 paper, perhaps using sticky-notes for recording the initial thinking.
- ▶ Read the information in the textbook and complete Get Active 2, page 7.

Plenary

- ▶ Ask pupils, in pairs, to write down one quiz question about the work that they have covered in the lesson.
- ▶ Collect in the questions and use them as a quiz to recap on the lesson.

Homework suggestion

Pupils read Worksheet 1.8, page 17 – what astronauts have said about how they felt when they saw the planet Earth for the first time suspended in space. They should then imagine that they are in space looking down on the planet, and write a poem of at least eight lines describing how they feel when they see Earth from space.

Extension activities

- ▶ Pupils create a Kids’ News Sheet that explains what global warming is. This news sheet should be geared for children in P4–P7. They must include pictures and diagrams that will help to explain what they are writing about. The following should be included:
 - ▶ An explanation of what global warming is
 - ▶ The effects global warming is having on the Earth
 - ▶ What we can do to make a difference
 - ▶ Puzzles and quizzes.
- ▶ Pupils use the internet to help them find out some information about climate change: selecting a search engine and typing in ‘climate change for kids’ should bring up lots of interesting sites.

Learning outcomes

- ▶ Work effectively with others.

Worksheet 1.8

Earth from space

- 1 Read what these three astronauts say about how they felt when they saw the planet Earth for the first time suspended in space.
- 2 Imagine you are in space looking down on the planet.
- 3 Write a poem of at least eight lines that describes how you might feel when you see Earth from space.

'Suddenly, from behind the rim of the moon, in long, slow-motion moments of immense majesty, there emerges a sparkling blue and white jewel, a light, delicate sky-blue sphere laced with slowly swirling veils of white, rising gradually like a small pearl in a thick sea of black mystery. It takes more than a moment to fully realise this is Earth ... home.'

Edgar Mitchell, USA astronaut

'Before I flew I was already aware of how small and vulnerable our planet is; but only when I saw it from space, in all its ineffable beauty and fragility, did I realise that human kind's most urgent task is to cherish and preserve it for future generations.'

Sigmund Jähn, German astronaut

'It suddenly struck me that that tiny pea, pretty and blue, was the Earth. I put up my thumb and shut one eye, and my thumb blotted out the planet Earth. I didn't feel like a giant. I felt very, very small.'

Neil Armstrong, USA astronaut

Chapter 1 What a wonderful world

Christians and the environment

Learning intentions

By the end of this lesson pupils will:

- ▶ know what some of the world faiths believe about humans and their responsibility to the environment
- ▶ know what Christians believe about how they should respect God's creation
- ▶ know what many Christian churches and charities are doing to ensure they are looking after the world

Key elements

Education for sustainable development

Cross-curricular skills

Communication

Thinking skills and personal capabilities

- ▶ Using own and others' ideas to locate sources of information



Lesson plan

Starter

- ▶ 'Each one, teach one'. Each pupil is given one of the statements found on Worksheet 1.9, pages 20–21. These outline what a number of world religions believe about the environment. Pupils are asked to tell each other their statement but at the same time remember the statements that are being told to them.
- ▶ In groups, pupils will try to complete Worksheet 1.10, pages 22–23, based on the statements they have just heard.

Development

- ▶ Read and discuss the information found in the textbook and complete Get Active 1, page 8.
- ▶ Continue to read the information in the textbook and complete Get Active 2, page 9.
- ▶ Using the information in the textbook, complete Worksheet 1.11, page 24.

Plenary

- ▶ In groups pupils write a definition of 'stewardship' on a sticky-note and stick it to the board.
- ▶ Each definition is read out and the class decides which is the best.

Homework suggestion

- ▶ Pupils try to find out what a local church is doing with regard to the environment.
- ▶ Ask the pupils to write five questions they could ask someone within the church based on what they have learnt in the lesson. They then ask a church member to answer the questions.

Extension activity

- ▶ Pupils imagine that a church wants to win the Eco-Congregation Award. They think about what areas they would have to look at within their church to win the award. What might they need to change or develop?
- ▶ Draw up a plan outlining what the church would have to do in order to win the award.

Learning outcomes

- ▶ Research and manage information effectively to investigate religious, moral and ethical issues.

Worksheet 1.9

‘Each one, teach one’

<p>Sikhism Humans create an environment that reflects how they feel inside. As it becomes more difficult to cultivate the land this reflects a spiritual emptiness within humans.</p>	<p>Sikhism Sikhs cultivate an awareness and respect for the dignity of all life, human or otherwise.</p>	<p>Judaism The Jewish attitude to nature is based on the belief that the universe is the work of the Creator. Love of God includes love of all His creations.</p>	<p>Judaism Nature in all its beauty is created for us, and our connection to nature restores us to our original state of happiness and joy.</p>
<p>Sikhism Respect for life is fostered where one first recognises and nurtures the divine inner spark within oneself, then sees it and cherishes it in others.</p>	<p>Judaism The scriptures inform us that the Earth is given to humans ‘to use and protect’.</p>	<p>Judaism Jewish teachings prohibit the destruction of anything from which humans may benefit. This applies to animals, plants, and even inanimate objects.</p>	<p>Hinduism All living beings are sacred because they are parts of God, and should be treated with respect and compassion.</p>

Worksheet 1.9 *continued*

‘Each one, teach one’

<p>Hinduism</p> <p>Most Hindus are vegetarian because of their belief in the sanctity of life. Even trees, rivers and mountains are believed to have souls, and should be honoured and cared for.</p>	<p>Buddhism</p> <p>Caring for the environment begins with caring for oneself: ‘When our hearts are good, the sky will be good to us,’ says Venerable Maha Ghosananda of Cambodia.</p>	<p>Islam</p> <p>We are Allah’s stewards and agents on Earth. We are not the masters of this Earth; it does not belong to us to do what we wish.</p>	<p>Islam</p> <p>The essence of Islamic teaching is that the entire universe is Allah’s creation. The whole of the rich and wonderful universe belongs to Allah, its Maker.</p>
<p>Buddhism</p> <p>The Buddha once received a donation of 500 new robes for his followers. So he considered what to do with the old ones. He decided that everything should be used and reused. So he recycled them to become towels.</p>			

Worksheet 1.10

Religions and the environment

Use the information you have learnt from each other to complete the sentences below.

Sikhism teaches:

1 Respect for life is fostered _____

2 Humans create an environment that reflects _____

Judaism teaches:

1 The Jewish attitude to nature is based on the belief that the universe _____

2 The scriptures inform us that the Earth is given to humans _____

Hinduism teaches:

1 All living beings are sacred because they are parts of God _____

2 Even trees, rivers and mountains are believed to have _____

Worksheet 1.10 *continued*

Religions and the environment

Buddhism teaches:

1 Caring for the environment begins with caring _____

2 Everything should be used _____

Islam teaches:

1 We are not the masters of this Earth _____

2 The whole of the rich and wonderful universe belongs _____

Worksheet 1.11

Christians and the environment

1 Describe what Christian stewardship is.

2 Describe the aim of 'The Christian Ecology Link'.

3 What is the Eco-Congregation Award?

4 Explain how churches can win the Eco-Congregation Award.

5 The award is given to a church for a limited time. Why is this and how long is the award valid for?

Chapter 1 What a wonderful world

Environmental damage and poverty

Learning intentions

By the end of this lesson pupils will:

- ▶ understand the effects of climate change particularly on the poorest countries
- ▶ know what Christian charities and churches are doing to ensure they are looking after the world

Key elements

Education for sustainable development

Cross-curricular skills

Communication

Using ICT

Thinking skills and personal capabilities



- ▶ Examine evidence
- ▶ Make links between cause and effect

Lesson plan

Starter

- ▶ Put together a PowerPoint® presentation of images that reflect different aspects of the impact global warming is having on climate change. Include some images that show actions contributing to global warming, such as industries pumping pollution into the atmosphere or a long queue of traffic, and images suggesting possible impacts of climate change, such as polar bears clinging to melting icebergs, flash flooding events, melting glaciers and ice caps, the parched earth of droughts, etc. Putting *climate change* as a search term into Google Images will produce a good range of suitable pictures. As a class, discuss whether the images are a cause of climate change or a possible effect of climate change.

Development

- ▶ Read and discuss the information in the textbook to complete Get Active 1, page 10.
- ▶ Read and discuss the information in the textbook to complete Get Active 2, page 11.

Plenary

- ▶ Place the fifteen statements about global warming from Worksheet 1.12, pages 28–29, into a box and ask pupils to come up and choose one. Each pupil then has to decide if the statement is true or false. The class decides whether he/she is correct or not. The correct answers are as follows:

- 1 True.
- 2 False: the WHO estimates that global warming may currently account for the deaths of as many as 150,000 people every year.
- 3 False: experts agree that global warming is often directly responsible for extreme weather events – storms, droughts, floods.
- 4 True.
- 5 False: the general retreat of mountain glaciers during the past century is one example of evidence that the climate is changing.
- 6 True.
- 7 False. A volcanic eruption may send ash and sulphate gas high into the atmosphere. The sulphate may combine with water to produce tiny droplets (aerosols) of sulphuric acid, which reflect sunlight back into space. Large eruptions can spread aerosols around the world. A massive volcanic eruption can cool the Earth for one or two years.
- 8 True. Very small differences in clouds may produce large feedbacks. An increase in high, thin clouds produced by the greenhouse effect would further increase the warming. This is because high, thin clouds are relatively effective in trapping infrared radiation (heat) while allowing the Sun's energy to pass through. In contrast, an increase in thick, low clouds could lessen the warming because these clouds reflect sunlight efficiently.
- 9 True. Ice-free surfaces tend to absorb more solar energy than ice-covered surfaces. Therefore, snow and ice cover have a cooling effect on the Earth. If global warming reduces the global snow and ice cover, the warming will be enhanced because more solar energy will be absorbed. This ice-reflectivity feedback does not operate in polar regions during the winter, when it is always dark or the Sun is very low in the sky.
- 10 True: methane is the second most significant cause of global warming, behind carbon dioxide. The way cows digest grass produces methane, which is exhaled with every breath.
- 11 False: it's thought that as a result of global warming 250 million people will be forced to leave their homes between now and 2050.
- 12 True.
- 13 True.
- 14 True.
- 15 True.

Homework suggestion

Ask pupils to read 'Climate change: facts and figures' from Worksheet 1.13, pages 30–31, and use the information to write a newspaper article for a children's newspaper highlighting some of the disastrous effects climate change will have on the world.

Extension activity

Ask pupils to create their own logo design to illustrate global warming.

Learning outcomes

- ▶ Research and manage information effectively to investigate ethical and environmental issues.

Worksheet 1.12

Statements about global warming

Statement 1

The Earth is half a degree warmer today than it was in the twentieth century.

Statement 2

The World Health Organisation estimates that global warming may currently cause the deaths of as many as 5000 people every year.

Statement 3

Global warming is not directly responsible for extreme weather events – storms, droughts, floods.

Statement 4

Wind patterns have changed as a result of global warming.

Statement 5

The general retreat of mountain glaciers during the past century does not indicate global warming.

Statement 6

The greenhouse effect is a natural warming process.

Statement 7

Volcanic eruptions can cause the Earth to warm up.

Statement 8

Clouds can affect the warming of the Earth.

Worksheet 1.12 *continued*

Statements about global warming

Statement 9

The Arctic and Antarctic help to keep the Earth cool.

Statement 10

Cows contribute to global warming.

Statement 11

As a result of global warming 1 million people will be forced to leave their homes between now and 2050.

Statement 12

Rainfall will reduce in some countries due to global warming, leading to drought and famine.

Statement 13

The world's surface temperatures are rising more rapidly than at any other point in the last 10,000 years.

Statement 14

30,000 elderly people across Europe died in the 2003 heatwave.

Statement 15

If the glacier in the Peruvian Andes melts, tens of millions of people along the Pacific coast would be deprived of fresh drinking water.

Worksheet 1.13

Climate change: facts and figures – sheet 1

At the current rate of carbon emissions, global average temperatures will rise 2 °C by 2050 according to research by the Intergovernmental Panel on Climate Change.

Unless urgent action is taken now the world faces these terrifying consequences:

- ▶ 250 million people will be forced to leave their homes between now and 2050 because of climate change. *'Human Tide: The Real Migration Crisis'*, Christian Aid report, May 2007.
- ▶ Acute water shortages for 1–3 billion people. *'2 degrees, one chance'* by Christian Aid, Tearfund, Oxfam and Practical Action.
- ▶ 30 million more people going hungry as agricultural yields go into recession across the globe. *The Met Office Hadley Centre*.
- ▶ Sea levels edging towards increases of up to 95cm by the end of the century, submerging 18 per cent of Bangladesh. *'The climate of poverty: facts, fears and hopes'*, Christian Aid, May 2006.

Not that we have to wait until then for the bad stuff, though.

- ▶ A 1 °C rise, expected by 2020, would see an extra 240 million people experiencing water 'stress' – where supply can no longer be stretched to meet demand. www.christianaid.org.uk/whatwedo/issues/climate_change.aspx
- ▶ The predicted 1.3 °C rise by 2025 would see tens of millions more going hungry due to falling agricultural yields in the developing world and rising global food prices. www.christianaid.org.uk/whatwedo/issues/climate_change.aspx

Making poverty permanent

However bad the consequences of climate change are for those living in relatively wealthy countries, they will be far, far more devastating for vulnerable people in poor countries.

It's getting hot in here

- ▶ Since 1850, a period in which today's richest countries have industrialised rapidly, levels of the greenhouse gas carbon dioxide in our atmosphere have risen 28 per cent; methane levels are 112 per cent higher.
- ▶ The world's surface temperatures are rising more rapidly than at any point in the last 10,000 years.
- ▶ The 1990s were the hottest decade since records began – and the temperature rises are speeding up.

Worksheet 1.13 *continued*

Climate change: facts and figures – sheet 2

Death and disease

Global warming is bad for your health as these figures attest:

- ▶ Climate change kills about 315,000 people a year through hunger, sickness and weather disasters, and the annual death toll is expected to rise to half a million by 2030. *'Human Impact Report: Climate Change – The Anatomy of a Silent Crisis', Global Humanitarian Forum, Geneva, May 2009.*
- ▶ Warmer, wetter weather will see malaria, which currently kills up to 3 million people a year, spread to new territories. There is evidence that it has already encroached into previously cool highland areas of Rwanda and Tanzania. *'The climate of poverty: facts, fears and hopes', Christian Aid, May 2006.*
- ▶ Christian Aid research, based on scientific predictions, reveals that 182 million people in sub-Saharan Africa alone could die from 'climate-change-associated diseases' by the end of the century. *'The climate of poverty: facts, fears and hopes', Christian Aid, May 2006.*

Water shortages

Reduced rainfall will lead to water shortages.

- ▶ The Sahel region of Africa has experienced drought-like conditions stretching back to the 1960s. There are no prospects of a revival in its rainfall levels.
- ▶ By 2006, 11 million people in east Africa had been put at risk of hunger by years of unprecedented drought. *'The climate of poverty: facts, fears and hopes', Christian Aid, May 2006.*
- ▶ Millions in Asia and South America depend on melting snow and glaciers for water. Due to rising temperatures, these are vanishing – since 1995 more than 90 per cent of glaciers have been in retreat. Once they are gone, they cannot be replaced.
- ▶ In Africa, major glaciers and ice caps on Mount Kenya, Ruwenzori and Kilimanjaro are melting fast (Kilimanjaro has lost some 82 per cent of its mass since 1912). *'The climate of poverty: facts, fears and hopes', Christian Aid, May 2006.*

Extreme weather

Climate change will increase the incidence of extreme weather patterns.

- ▶ 90 per cent of the victims of weather-related natural disasters during the 1990s lived in poor countries.
- ▶ Over the past 35 years, storms of the force of Hurricane Katrina have almost doubled. Climate scientists say rises in the temperature of the sea surface are the most likely cause. [www.politics.co.uk/comment/environment-and-rural-affairs/comment-climate-change-is-a-matter-of-injustice-\\$1281545.htm](http://www.politics.co.uk/comment/environment-and-rural-affairs/comment-climate-change-is-a-matter-of-injustice-$1281545.htm)
- ▶ Bangladesh could experience 15 per cent more rainfall by 2030, putting 20–40 per cent more of its land at risk of flooding. *'Commitment for Life', Christian Aid, 2008*

Chapter 1 What a wonderful world

Global meltdown

Learning intentions

By the end of this lesson pupils will:

- ▶ know the consequences of global warming
- ▶ be aware of what individuals can do to improve the environment

Key elements

Education for sustainable development

Cross-curricular skills

Communication
Using mathematics

Thinking skills and personal capabilities



- ▶ Generate possible solutions

Lesson plan

Starter

- ▶ Obtain a copy of the film *The Day after Tomorrow*.
- ▶ Watch the part where the storm begins through until it ends.
- ▶ Discuss what happened and why it happened. Discuss with the pupils if they think this could be a reality.

Development

- ▶ Read and discuss the information in the textbook and complete Get Active 1, page 13.
- ▶ Pupils read the information on the Doomsday Clock on Worksheet 1.14, pages 34–35. Plot a graph that shows its movements over the last 60 years.
- ▶ Read and discuss the rest of the information in the textbook, page 13.

Plenary

- ▶ Complete Get Active 2, page 13, on what a perfect world would be like.

Homework suggestion

Read and complete Worksheet 1.15, page 36.

Extension activity

This would need to take place after pupils had read Worksheet 1.15 for homework. In groups, pupils discuss what they think might make the Doomsday Clock move closer to midnight. Each group decides on one specific thing. They write it on to a sticky-note and stick it to the board. The whole class then discusses which one they think would make the clock move forward and why.

Learning outcomes

- ▶ Show deeper understanding by thinking critically and flexibly, solving problems and making informed decisions.

Worksheet 1.14

DoomsdayClock.org

The Doomsday Clock is a symbolic clockface maintained since 1947 by the Board of Directors of the *Bulletin of Atomic Scientists* at the University of Chicago. It uses the analogy of the human race being at a time that is ‘a few minutes to midnight’, where midnight represents destruction by nuclear war, and has appeared on the cover of each issue of the *Bulletin of Atomic Scientists* since its introduction. The clock was started at seven minutes to midnight during the Cold War in 1947, and has subsequently been moved forwards or backwards at intervals, depending on the state of the world and the prospects for nuclear war.

The Doomsday Clock’s minutes to midnight, 1947–2007

- 1949 The Soviet Union tests its first atomic bomb. Clock changed to three minutes to midnight (–4 change).
- 1953 The US and the Soviet Union test thermonuclear devices within nine months of one another. Clock changed to two minutes to midnight (–1 change).
- 1960 In response to a perception of increased scientific co-operation and public understanding of the dangers of nuclear weapons, clock is changed to seven minutes to midnight (+5 change).
- 1963 The US and the Soviet Union sign the Partial Test Ban Treaty, limiting atmospheric nuclear testing. Clock changed to twelve minutes to midnight (+5 change).
- 1968 France and China acquire and test nuclear weapons (1960 and 1964 respectively), wars rage on in the Middle East, Indian subcontinent and Vietnam. Clock changed to seven minutes to midnight (–5 change).
- 1969 The US Senate ratifies the Nuclear Non-Proliferation Treaty. Clock changed to ten minutes to midnight (+3 change).
- 1972 The US and the Soviet Union sign SALT I (the Strategic Arms Limitation Treaty) and the Anti-Ballistic Missile Treaty. Clock changed to twelve minutes to midnight (+2 change).
- 1974 India tests a nuclear device (Smiling Buddha), SALT II talks stall. Clock changed to nine minutes to midnight (–3 change).
- 1980 Further deadlock in US–USSR talks, increase in nationalist wars and terrorist actions. Clock changed to seven minutes to midnight (–2 change).
- 1981 Arms race escalates, conflicts in Afghanistan, South Africa and Poland add to world tension. Clock changed to four minutes to midnight (–3 change).

Worksheet 1.14 *continued*

- 1984 Further escalation of the arms race under the US policies of Ronald Reagan. Clock changed to three minutes to midnight (–1 change).
- 1988 The US and the Soviet Union sign treaty to eliminate intermediate-range nuclear forces, relations improve. Clock changed to six minutes to midnight (+3 change).
- 1990 Fall of the Berlin Wall, success of anti-communist movements in Eastern Europe, Cold War nearing an end. Clock changed to ten minutes to midnight (+4 change).
- 1991 The US and the Soviet Union sign the Strategic Arms Reduction Treaty. Clock changed to seventeen minutes to midnight (+7 change).
- 1995 Global military spending continues at Cold War levels; concerns about post-Soviet nuclear proliferation of weapons and brainpower. Clock changed to fourteen minutes to midnight (–3 change).
- 1998 Both India and Pakistan test nuclear weapons in a tit-for-tat show of aggression; the US and Russia run into difficulties in further reducing stockpiles. Clock changed to nine minutes to midnight (–5 change).
- 2002 Little progress on global nuclear disarmament; the US rejects a series of arms control treaties and announces its intentions to withdraw from the Anti-Ballistic Missile Treaty; terrorists seek to acquire nuclear weapons. Clock changed to seven minutes to midnight (–2 change).
- 2007 This is the first time it has included climate change as an explicit threat to the future of civilisation. The clock now stands at five minutes to midnight (–2 change).

Worksheet 1.15

Global meltdown

1 What sort of world do you want your children and grandchildren to grow up in?

2 If we continue to treat the world as we do what will be the consequences?

3 What must we do to try and ensure this doesn't happen?
