

Key Stage 3

North West

schools are world

changing



About this resource ...

"The effects of a changing climate can already be seen. Temperatures and sea levels are rising, ice and snow cover are declining, and the consequences could be catastrophic for the natural world and society. Scientific evidence points to the release of greenhouse gases, such as carbon dioxide and methane, into the atmosphere by human activity as the primary cause of climate change. We need a profound change in the way we generate and use energy, and in other activities that release these gases. At the same time we must prepare for the climate change that cannot now be avoided. The North West Regional Assembly funded this Regional Climate Change & Sustainable Energy Teaching Resource in response to our responsibility to lead on such an action arising from "Rising to the Challenge - A Climate Change Action Plan for England's North West 2007".

Visit www.climatechangenorthwest.co.uk for further information on our (and partner) activities in the on-line version of our region's Climate Change Action Plan."

This resource is not designed to just to impart facts about climate change, or to make you feel guilty. We know the climate is changing and the current prognosis for our communities is not good.

This resource is about stimulating 'big picture thinking' and how we manage our lives and use resources in the context of a changing climate. It is about how we encourage young people to engage with change, recognising that change will happen whether we like it or not, and envisioning change as a positive force for the good, and in this case towards a low carbon high quality future.

We strongly urge you to read the brief introduction by Ken Webster and share our inspiration that shaped the creation of this resource. Today we will influence our changing future, the question is how?

Explore and be world changing!

This resource has been written by the Field Studies Council, with funding from the North West Regional Assembly. The FSC is an independent educational charity formed in 1943 to help people discover, explore, understand and be inspired by the natural environment ... 'bringing environmental understanding to all'. The FSC has become internationally respected for its national network of 17 educational centres, international outreach training projects, research programmes, information and publication services and wide range of professional training and leisure courses. FSC goes beyond conventional thinking to challenge the underlying assumption about how education can lead to a sustainable future. We ask what really brings about change and how can our learning achieve this? Our inspiration is always to deliver capacity building for sustainable change.

The resources are based on original ideas by Ken Webster (independent consultant), Andrew Turney (Head of Centre, FSC, Brockhole) and Richard Dawson (Project Manager, FSC EE), with activities written by Annie Duckworth, Eve Jakeways, Ruth Suddaby, Jayne Buchanan, Tracey Chaplin, Sam Carter, Jocelyn Riley, Alison Stott and Ben O'Donovan.

This project is a collaboration, between FSC Brockhole and FSC Environmental Education. The project was managed by Andrew Turney.

Activities and Resources summary

Chapter 1 A Changing world – Where are we now?

Learning intentions

- To introduce the principle that change is normal, ordered, and happens in a logical sequence.
- To show that change can be seen in a variety of timescales and perspectives.
- To put the modern world into a time perspective.
- To suggest that the presence of humans on earth may have global consequences.

Activity title and summary	Pupil resources to accompany
1. Timeline. Creating a timeline as a class.	<ul style="list-style-type: none"> • Timeline worksheet containing images.
2. Creating your own timelines. Pupils work in small groups to research and make their own timelines.	<ul style="list-style-type: none"> • Creating your own timelines worksheet.
3. Extension activity: Identifying how people have changed earth's recent history. Internet research activity.	<ul style="list-style-type: none"> • Researching key changes in human history worksheet.
4. Consequences of change. Developing graphic interpretation skills.	<ul style="list-style-type: none"> • Consequences of change worksheets 1-3.

Chapter 2 Mills and looms – Where are they now?

Learning intentions

- To show that change offers opportunities, and improvements to the quality of life in the North West.
- To examine examples where industry and society has been compelled to change, and how this has advantages and disadvantages.
- To identify that peak oil and climate change are triggers for change that can benefit the North West.
- To show that a post fossil carbon world can be just as fun interesting as now.

Activity title and summary	Pupil resources to accompany
1. Power point images of industrial change. A power point presentation with questions to stimulate discussion.	<ul style="list-style-type: none"> • Change in the North West power point.
2. Our changing world. A card sort showing the changing world of everyday products and services. Images show the key developments for ten areas including transport, lighting and phoning. Questions prompt analysis and reflection.	<ul style="list-style-type: none"> • Our changing world card sort images to cut up. • Questions worksheet.
3. Reaction to change. A worksheet exploring our feelings about change.	<ul style="list-style-type: none"> • Exploring how we feel about change worksheet.

Chapter 3 What's oil the fuss about?

Learning intentions

- To consider how much our lives in Britain today are dependent on oil and other fossil fuels.
- To uncover the amount of oil and other fossil fuels used in the production and transportation of everyday products in today's society
- To give the historical context of how recently the "oil dependency" culture developed
- To understand how changing lifestyles -both locally and globally are putting a much greater demand on resources
- To make the link between lifestyle choices and climate change.

Activity title and summary	Pupil resources to accompany
1. Now and then. Completing a table comparing everyday life now and in the 1950s. Discussion to follow.	<ul style="list-style-type: none">• Now and then worksheet.
2. Oil detectives. Pupils work in pairs to consider the use of oil in everyday products.	<ul style="list-style-type: none">• Oil detectives worksheet.• Resource sheet 1 – images.
3. Oil in my life. Series of three connected activities in which pupils reflect on the use of oil in their lives, and some of the big questions that this raises.	<ul style="list-style-type: none">• Resource sheet 2 – WEEE image.• How has the discovery of crude oil influenced your life? Worksheet.• What exactly is the link? worksheet.

Chapter 4 Right here right now?

Learning intentions

- To enable students to challenge what is accepted as normal in everyday activities.
- To consider the idea that there is a hidden price stored up for the future in every unsustainable product.
- To build an understanding of each of the greenhouse gasses and their contribution to climate change.
- To understand some of the global consequences of climate change.

Activity title and summary	Pupil resources to accompany
1. Poem interpretation. Individual or class activity as introduction.	<ul style="list-style-type: none">• Poem interpretation sheet.
2. Sustainability mysteries. Groups examine a range of statements to explore the issues behind everyday products or events.	<ul style="list-style-type: none">• Sustainability mysteries resources 1-4.• Mysteries images power point.
3. Where do the greenhouse gases come from? Pupils study a table of information, discuss answers to 3 questions and justify their answers.	<ul style="list-style-type: none">• Greenhouse gases resource sheet.
4. What on earth will an increase in greenhouse gasses do? True or false activity for pairs or small groups.	<ul style="list-style-type: none">• True and false card sheets.

Chapter 5 Am I bovered?

Learning intentions

- To explore the implications for the North West of doing nothing in response to peak oil and related climate change predictions.
- To provide pupils with a chance to consider their personal responses and reactions to these implications, as well as developing their knowledge and understanding about the region in which they live.
- To deliberately focus on the negative implications of doing nothing in order to consider the problems that will or may arise. This prepares pupils to consider options for mitigating and adapting in chapters 6 and 7.

Activity title and summary	Pupil resources to accompany
1. The “Do nothing” response – How might NW England be affected? Paired or small group activity identifying possible locations for information cards on a map of the North West.	<ul style="list-style-type: none">• The Do nothing card sheet.• Do nothing A3 map sheet.• Additional NW map resource.
2. Am I bovered? Individual or paired activity exploring pupil’s personal reactions and feelings concerning these scenarios.	<ul style="list-style-type: none">• How will climate change in the North West affect you? worksheet.• The Do nothing cards.

Chapter 6 Bright green future?

Learning intentions

- To explore the actions which can be taken in response to the challenges of climate change and peak oil.
- To introduce the difference between adapting to and mitigating climate change.
- To explore the concept of carbon footprints and relate this to everyday lives.
- To examine in more depth positive ways to mitigate climate change, focusing on solutions through changing ideas about design.
- To enable pupils to be excited about the future, and to develop their skills of creativity, evaluation and presentation.

Activity title and summary	Pupil resources to accompany
1. Character cards and carbon footprints part 1. Small groups are assigned a character. They position themselves in character along a continuum in response to a series of questions.	<ul style="list-style-type: none">• Character cards.
2. Character cards and carbon footprints part 2. Each group identifies the main components of their character’s carbon footprint, and make comparisons.	<ul style="list-style-type: none">• Character cards.• Character carbon footprint worksheet.
3. Understanding definitions. Two brief sorting activities to clarify the terms adapting and mitigating. The power point on renewable energy is a useful accompaniment to this.	<ul style="list-style-type: none">• Understanding definitions worksheet.• Do you know your adapting from your mitigating worksheet?

	<ul style="list-style-type: none"> • Renewable energy power point.
<p>4. Designing for the future part 1. Pupils study resources about eco-design principles, including product examples. They then evaluate a series of products using a range of criteria. This may be done individually, in pairs or small groups.</p>	<ul style="list-style-type: none"> • Rethinking product design resource sheet. • A new way pupil resource sheet. • Designing for a bright green future resource sheet. • Evaluating product design score sheet. • Eco-design case studies sheets 1-3.
<p>5. Designing for the future part 2. Individuals or small groups design their own eco product to present to the Green dragons den. Mind maps are used within the planning stages.</p>	<ul style="list-style-type: none"> • Green dragons den brief. • Evaluating product design score sheet. • Mind map example for product design. • Any of the above resources from part 1.

Chapter 7 The future starts here?

Learning intentions

- To confirm and widen pupil understanding about sustainability.
- To help bring ideas about adapting to climate change and mitigating its effects to life for the pupils via an activity drawing on their creativity and imagination.
- To raise pupil awareness of the exciting developments in eco-design already taking place in schools across the country, and to generate excitement about the type of learning environment that they would enjoy being part of in the future.
- To prompt discussion about the range of actions that can be taken within a school to respond to the challenges of climate change and peak oil. Pupils may hopefully be inspired to do those things which are within their power, whilst also becoming aware that many actions require the commitment of the whole school community and considerable financial investment.

Activity title and summary	Pupil resources to accompany
<p>1. North West examples of the sustainable doorways. Paired activity involving map work and explanations to demonstrate understanding.</p>	<ul style="list-style-type: none"> • Sustainable doorways worksheet.
<p>2. Designing a new school site. Individual or paired activity designing a sustainable school site. Presentation of ideas can be chosen according to preferred learning style and available time and resources.</p>	<ul style="list-style-type: none"> • Design brief sheet. • Design ideas sheet. • More design ideas sheet. • My inspiration worksheet.

Introduction to the KS3 Climate Change Resource Pack

This KS3 “Climate Change” pack has been developed on behalf of the North West Regional Assembly (NWRA) by the Field Studies Council (FSC) at Brockhole.

It has been commissioned due to a demand from teachers for “ready to use” resources which explore the causes and consequences of global warming and climate change in a way that is engaging to students and has a relevance to their own lives in the North West of England.

There are 7 chapters which collectively explore the theme of “changes over time” in a chronological order (distant past, recent past, present and future). Each chapter contains relevant background information for teachers, activity guidelines and ready to use student worksheets and resources (plus answer sheets where appropriate).

A poster template is included in the resource pack. Its intended use is as a “*climate change knowledge bank*”, where students can post questions, ideas, facts or thoughts about climate change during their studies.

The resource pack has been written in line with current National Curriculum programmes of study and is particularly (although by no means exclusively) relevant to science, geography and citizenship (see table on page below).

A conscious effort has been made when writing this publication to ensure that all activities are informative, thought provoking and positive, rather than being overly gloomy or pessimistic. This has been a deliberate decision, the aspiration being to encourage young people to feel empowered, willing and able to make a difference. The strong regional focus which flows through many of the activities and case study materials will hopefully reinforce this.

Chapter contents

Chapter 1 A changing world – Where are we now?

This chapter investigates changes that have occurred during the earth’s history. By contextualising the arrival of “people” through ordering images along a timeline, pupils can visualise just how recently in the earth’s history humans evolved. The activities also illustrate some of the consequences of this, identifying key events in human history that have triggered big changes. Pupils are encouraged to consider the associated global and environmental consequences.

Chapter 2 Mills and looms - Where are they now?

This chapter continues the “changes” theme, looking at aspects of recent history, including references to industries in North West England. The chapter focuses on the last 200 years, looking at products and commodities common in everyday life, and how they have changed over time. Pupils explore both the triggers for change and the environmental, economic, cultural and social impacts which these changes have brought about. They also reflect upon how they and other people may feel about change. Pupil activities include card sorting and discussion.

Chapters 3 What's Oil the Fuss About?

Through a range of activities, pupils consider just how dependent on oil our lives in the West have become. The vast array of products which contain oil as a raw ingredient is explained along with the importance of oil as a fuel in both manufacture and transportation of products, foods and people. A very direct link between crude oil and the pupils own lives is established through the activities. The chapter raises questions about what the impacts and consequences of this dependency are. The concept of Peak Oil is explained. Activities include discussions and use of visual images to identify oil use.

Chapter 4 Right Here Right Now?

This chapter encourages pupils to reflect on their own values and attitudes. They are invited to question what they consider to be normal and to evaluate sustainable and unsustainable practices in their lives. The issue of human activity enhancing the greenhouse effect and causing climate change is explained. The global consequences of this are looked at within a true or false activity. Other activities include poem interpretation and mystery decision making.

Chapter 5 Am I Bovered?

This chapter explores the "do nothing" scenario, looking specifically at how the North West will be affected by climate change. Pupils are presented with examples of different impacts, such as more freak weather events, loss of habitats and biodiversity and increased incidents of ill health. The activities involve becoming more familiar with the geography of the North West region, identifying the impacts which are particularly relevant to their local area, and considering values and attitudes concerning the range of likely impacts.

Chapter 6 Bright Green Future?

This chapter looks at mitigation and adaptation as responses to climate change. It investigates potential changes to our lifestyles, introducing the idea of carbon footprints. Its main focus is on mitigation and different options which could lead to a brighter, as well as "greener", sustainable future. Within this the issue of reducing dependency on oil is explored. This chapter takes an optimistic approach, encouraging pupils to think in a different mindset about commodities and introducing the closed loop, and cradle to cradle technology. Activities include use of character profiles, product evaluation and designing and presenting their own eco-designs.

Chapter 7 Future Starts Here?

This chapter looks at applying what has been learnt in the previous chapters to design a sustainable school for the future. Examples of current eco-design within schools are used for information and inspiration. Activities include references to the DCSF Sustainable Doorways, and involve a piece of creative work (which can be tailored to preferred learning styles). It is hoped that pupils will take some of these ideas forward into their own lives, within both the school and home environment.

Contents

Each chapter contains

- i) Teacher notes and background information (containing learning intentions, background information and relevant web links).
- ii) Activity guidelines, learning intentions and answer sheets.
- iii) Student worksheets and other resources.

The materials provided in each chapter have been designed to use “straight off the shelf” in order to reduce preparation time, but alternatively could provide a springboard for teachers to deliver their own materials.

Use of this resource within school

The teacher notes within each chapter aim to provide enough background information for a teacher of any subject to feel confident delivering this material, and to engage in the conversations or debates with pupils which may arise.

This resource could be used in a variety of ways within school, within Key Stage 3. Some possible approaches are suggested below:

- One department identifies an opportunity to deliver all 7 chapters chronologically to a year group. There are many opportunities for some of the activities (or extension activities) to be undertaken by other departments to create supportive and effective cross-curricular links.
- Several departments choose to deliver the chapters between them, co-ordinating this so that the understanding can be transferred where this is particularly important.
- The year group or Key Stage is off timetable for several days, using a range of these resources as appropriate to explore the issues of climate change and oil dependency, and possible solutions to these challenges.

Chapters 1 – 5 can be used in isolation and the activities undertaken successfully within this context. Chapters 6 and 7 do rely on some prior understanding (from chapters 3 and 4 in particular), and can be undertaken most effectively with this in mind. All chapters contain activities which can be used out of context to supplement existing teacher schemes of work.

Curriculum links:

The table below highlights where resources and activities are aligned to specific areas within the new KS3 programmes of study.

A tick (✓) identifies generic links to a subject, while a numerical reference highlights particular content areas within the programmes of study which the activities touch on or meet.

There are opportunities to teach elements of the 'Climate Change' topic within a broad spectrum of subjects and the cross curricular nature of this resource maintains this flexibility.

(new)	Subject	Art & Design	Citizenship	Design & Technology	English	Geography	History	Information & Communication Technology	Mathematics	Modern Foreign languages	Music	PE	Religious Education	Science
	Chapter													
	1		✓ 2.1		✓	✓ 1.2 1.5	✓ 1.1 1.3 1.5		✓					✓ 1.1 2.2 3.4
	2		✓ 2.1	✓ 1.1 1.2 1.4	✓	✓ 1.1 1.2 1.3 1.5	✓ 1.1 1.3 1.4 2.3	✓						✓ 1.2 3.4
	3		✓ 2.1 2.2 2.3		✓	✓ 1.2 1.4 1.6 2.1	✓ 1.3	✓	✓				✓	✓ 1.1 1.2 2.2 2.3 3.4 4
	4		✓ 1.1 1.2 2.1 2.2 2.3		✓	✓ 1.7	✓						✓ 1.5 1.6	✓ 2.2 2.3 3.4
	5		✓ 1.2 2.1 2.2 2.3		✓	✓ 1.1 1.2 1.3 1.6 2.3							✓	✓ 2.2 2.3 3.4
	6	✓ 1.1 1.2	✓ 1.2 2.1 2.2 2.3	✓ 1.1 1.2 1.3 1.4	✓	✓		✓	✓	✓			✓ 1.5	✓ 2.2 3.4
	7	✓ 1.1 1.2	✓ 1.2 2.1 2.2 2.3	✓ 1.1 1.2 1.3 1.4	✓	✓		✓					✓ 1.5	✓ 2.2 3.4

Chapter 1 A changing world – where are we now?

Activity guidelines

Chapter aims and learning intentions

- To introduce the principle that change is normal to show that change is ordered, and happens in a logical sequence.
- To show that change can be seen in a variety of timescales and perspectives.
- To put the modern world into a time perspective.
- To suggest that the presence of humans on earth may have global consequences.
-

Activity 1 Timeline

This activity introduces timelines and can be completed within small groups or in pairs.

- This activity is designed to help pupils to understand sequence, cause and effect, and changes through time. A series of key events in the evolution of life on planet earth have been selected and represented with visual images. Pupils should cut up the worksheet and examine each of the images and labels. This may generate some questions if these terms are new to them.
- Pupils work together to place the cards into chronological order, and verbalise their reasoning. The correct sequence is shown below. Cards 6 and 7 are interchangeable in order.

1. Galaxy
2. Earth
3. Single cell life
4. Fish (sea life)
5. Amphibian
6. Reptile
7. Early flying animal
8. Primate
9. Homo Sapiens
10. James Bond

Activity 2 Creating your own timelines

This activity involves pupils undertaking some research to create their own timelines, working in small groups.

- Pupils create two separate timelines on the classroom wall. They need to be quite long!
- On the top one pupils research and fill in different galactic/geological events on the timeline e.g. big bang, formation of earth, life begins (single cell), reptiles, mammals, apes, homo sapiens, birds, and so on.
- On the lower graph they do the same, but this time for a history of humans from Stone Age to the present day, with events such as the industrial revolution, antibiotics, vaccination, spinning jenny, coal, discovery of crude oil, cars, water power shown on it.
- Pupils could first discuss what are important events that ought to be shown, then research them individually, in pairs, or in groups.

Below is a simplified version of some possible results, but without the associated text.

Timeline of life on earth

10 billion years ago

Present day



Timeline of important events in human history

4000BC

Present day



Activity 3 Extension activity: Identifying how people have changed earth's recent history

This is an internet research activity in which pupils investigate some key changes during human history.

- Pupils aim to complete the table provided, filling in the missing boxes.
- They then circle in red events which they think are significant factors of change. Some key missing ideas are included in the table below.

Time	Age	Technologies	Homes	Agriculture	Woodland
4000 BC	Neolithic	Stone age	Mud huts	Hunter/gatherer	100%
2000 BC	Bronze Age	Manufacture of bronze Flint implements	Thatched sunken hollows	Wheat, barley, cattle, sheep, goats, pigs	Woodland clearance
600 BC	Iron Age Celts	Plough Beaker people - pottery	Hill forts, arched timber, wicker walls, thatched roofs	Crops, animals, pigs for clearance	Woodland clearance
0	Romano-Britain	Roads, pottery	Stone-built villages and towns Central heating	Arable and livestock farming	
450 AD	Anglo Saxon	Brewing Recording of history	Wood and thatch		45%
1066 AD	Norman				35%
	Middle ages	Simple 'industry' Black death	Churches, castles		
1500 AD	Tudors				
1660 AD	Stuarts	Glass, clocks, chemicals			26%
1750 AD	The industrial revolution	International trade Waterpower Canals Mills Cotton Spinning/weaving Steam power	Stately homes and mansions	Root crops Selective breeding Rotation of crops	
1800 AD	Victorians	Coal/coke Railways Steel ships Blasting with electricity		First OS maps	
1900 AD		Crude oil Internal combustion engine Turbines Cars Electricity	Women's rights Tower blocks	Artificial fertilizers Tractors Intensive agriculture World trade opens up	
2000 AD	Modern world	Improvements in health	Eco-homes		7.3%

Activity 4 Consequences of change

This activity involves graph work and a consideration of how key changes in human history can influence one another. It can be completed individually.

- Pupils complete the tasks on the worksheets, developing their understanding of how to interpret graphs and explain trends.
- The final task asks them to link the graphs together to explain how one change (or trend) has led to another. An understanding of these relationships will support further learning in following chapters.

Chapter 1 A changing world: where are we now? An evolutionary framework

Teacher Notes and background information

- **Aims**
- **Background information**
- **Web links**

The aims behind this chapter

This chapter forms an introduction to the basic fact that change is normal and is happening all the time. In particular, pupils should be encouraged to understand that change can be for the better as well as for the worse. The chapter looks at change over different magnitudes starting with universal timescale and the Big Bang theory, moving through evolutionary change and geological change, to changes that have happened since people first appeared on Earth. Pupils need to understand the principle that cause and effect will have sequential outcomes, so for example, a planet cannot exist before its star, and a complex celled mammal cannot exist before a simple cell. Finally, the chapter introduces the idea that the presence of people in large numbers on the earth, and the way in which they live has consequences.

Background information

The world is in a constant state of change over a series of different time spans, for example:

A Galactic evolution

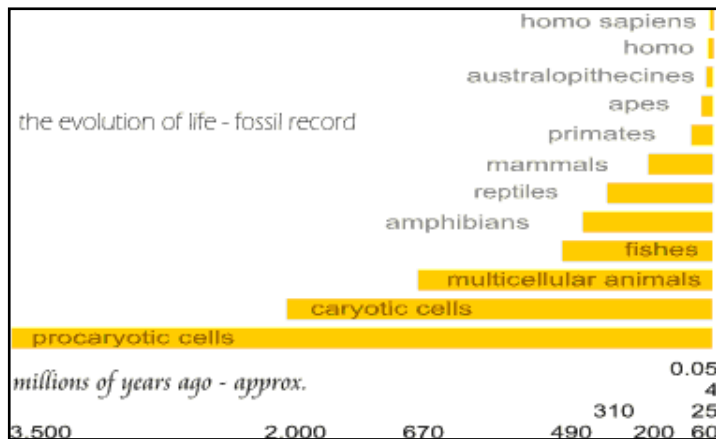
The Universe began about ten billion years ago in a violent explosion. At about 10,000 years after the Big Bang, the temperature had fallen to such an extent that the energy density of the Universe began to be dominated by massive particles, rather than light and other radiation. This meant that gravitational forces could start to take effect, and galaxies began to develop.

B Geological evolution

Geologic time is immense - the Earth formed roughly 4.6 billion years ago and has been evolving ever since. Life began roughly 3.8 billion years ago but remained in a very simple form for roughly 2 billion years after that. Complex life forms have been evolving for the last 550 million years. Dinosaurs were present from 145 until 65 million years ago, when there was a major extinction episode. Ice ages have occurred repeatedly during the last 2 million years, with the last one ending 10,000 years ago, and the next predicted to be in 25,000 years time. Human evolution has been brief by comparison, with modern humans originating within Africa roughly 200,000 years ago.

C Evolution of life

A theory that many different forms of one species are created, but only the ones with advantages survive to reproduce, and spread these advantages, such as better camouflage, more strength, better eyesight, and so forth. Slowly, over many generations, the simple single-celled life forms, evolved into more and more complex multiple-celled organisms, adapting to the changing environment of the earth. Charles Darwin in 1859 in "The Origin of Species" proposed that all living things on Earth share one common ancestor. The discovery of new evidence of evolution has repeatedly confirmed his conclusion.



D Long term natural climate change

Earth's climate is continuously changing as a result of natural occurrence. The principle ones are:

- changing continental positions
- uplift of continental blocks
- reduction of carbon dioxide in the atmosphere
- changes in earth's orbit

The piece of earth's crust that we now know as Britain has experienced ice ages, hot deserts and tropical rainforests and different times.

E Changes within human society

Human evolution can be broken down into several different, but interlinked, groups of changes:

• Industrial evolution

The Industrial Revolution changed the ways in which the world produced its goods. It also changed our societies from mainly agricultural to industrial and manufacturing. The industrial revolution first started in Great Britain during the 18th century. Other countries such as Germany, the United States and France followed suit. Timelines for industrial evolution differ in different parts of the world, with developing countries only beginning industrial change at the present day.

• Economic reform

Primary societies that produce their own individual needs have no need of money, but as they evolve and start to create surpluses and needs trade begins, and with that the need for money. Scales are small inter-village to begin with, but progress rapidly to global economies. Different societies in different countries are all at different points on the economic time-line.

• Lifestyle changes

Throughout history lifestyles what we consider to be 'necessities' are constantly changing as new technologies are discovered. A list of necessities for a tribal lifestyle would be real, i.e. food and shelter, but in modern Europe the list would include things like freezers, cars,

mobile phones etc. Even taken through three generations, grandparent, parent and child, the list has changed dramatically, or 'evolved'.

Web links

Formation of galaxies: <http://space.about.com/od/astronomyspacehistory/a/timelineuni.htm>

Timescale for formation of the universe: www.library.thinkquest.org

Geological history: http://www.infobritain.co.uk/Geological_History_UK.htm

History of evolution, the spiral of life: <http://sci.waikato.ac.nz/evolution/EvolutionOfLife.shtml>

Climate change: <http://www.searchanddiscovery.net/documents/gerhard/index.htm>

Ages of man: <http://www.britannia.com/history/>

Homes through history: <http://www.woodlands-junior.kent.sch.uk/Homework/houses.html>

History of technology: http://inventors.about.com/od/timelines/Timelines_of_Invention_and_Technology.htm

History of agriculture: <http://www.arcresources.org.uk/module2/module02.1/text02.1.01.pdf>

Trends in climate, trees, population etc:

http://www.stewardwood.org/woodland/tree_loss.htm

http://www7.nationalacademies.org/ocga/testimony/Climate_Change_Science_and_Economics.asp

http://www.globalchange.umich.edu/gctext/Inquiries/Inquiries_by_Unit/Unit_6.htm

<http://environment.newscientist.com/channel/earth/climate-change/dn11638>

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Mountain view	by spikewerx
Sailing boats	by hazler_06
Sailing	by zoer
Bridge house	by Jim Pritchett
Chester	by harrymoon
Tram	by Shantanu Bhar
Liverpool	by DeclanMcAleese
All you need is love	by majamom

Chapter 1 A Changing world – where are we now?

Activity guidelines

Earth	by lakerae
Fish	by noodlesgirly
Frog	by wumpiewoo
Galaxy	by DJMcCrary
Reptile	by MrClean1982
Australopithicine	by Joe Benjamin
Primate	by Shanghung Lin
Homo Sapien	by Mike D'Angelo
James Bond	by nwistheone

Chapter 1 A Changing world – where are we now?

Activity sheet 1 Timeline

Earth	by lakerae
Fish	by noodlesgirly
Frog	by wumpiewoo
Galaxy	by DJMcCrary
Reptile	by MrClean1982
Australopithicine	by Joe Benjamin
Primate	by Shanghung Lin
Homo Sapien	by Mike D'Angelo
Spice Girls	by no-frills marilyn
Big bang	by cottonjoe
Flint	by Travis S
Village	by Chrissam 42
Loom	Carla Soares Photographie
Oil drilling	by arbyreed
Drugs	by cia-chow
Car	by Karenwithak

Chapter 1 A Changing world – where are we now?

Activity 1 Timeline worksheet

Cut out the pictures below and place them in chronological order.

Helpful hint: There are certain things that have to happen in order for an event to occur. For example, a more complex life-form cannot come before a single-celled animal and a planet cannot exist before its sun.



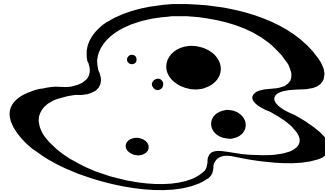
Reptile

Homo Sapiens

Fish

Amphibian

Galaxy



Early flying animal

James Bond

Single Cell

Primate

Earth

Chapter 1 A changing world - Where are we now?

Activity 2 Creating your own timelines worksheet

Research activity.

Create two separate timelines on the classroom wall. They need to be quite long!

The top one will show galactic/geological events on the timeline e.g. big bang, formation of earth, life begins (single cell), reptiles, mammals, homo sapiens, and so on.

The second graph will show significant advances and events in the history of people from Stone Age to the present day, with events like the industrial revolution, antibiotics, vaccination, spinning jenny, coal, discovery of crude oil and so on shown on it.

In groups, decide what events should be placed on the timeline, then choose who will research which topic, and produce a picture and some text to place on the timelines.

Timeline of life on earth

10 billion ybp

Present day

Timeline of important events in human history

4000BC

Present day

Chapter 1 A changing world – where are we know?
Activity 3 Researching key changes in human history

Internet Research activity 1. Fill in some of the missing boxes. 2. Circle in red events which you think are significant factors of change.

Time	Age	Technologies	Homes	Agriculture	Woodland
4000 BC	Neolithic	Stone age	Mud huts	Hunter/gatherer	100%
2000 BC	Bronze Age	Manufacture of bronze Flint implements	Thatched sunken hollows	Wheat, barley, cattle, sheep, goats, pigs	Woodland clearance
600 BC	Iron Age Celts	Plough Beaker people - pottery	Hill forts, arched timber, wicker walls, thatched roofs	Crops, animals, pigs for clearance	Woodland clearance
0	Romano-Britain	Roads, pottery	Stone-built villages and towns Central heating	Arable and livestock farming	
450 AD	Anglo Saxon	Brewing Recording of history	Wood and thatch		45%
1066 AD	Norman				35%
	Middle ages	Simple 'industry'	Churches, castles		
1500 AD	Tudors				
1660 AD		Glass, clocks, chemicals			26%
1750 AD		International trade Waterpower Canals Mills Cotton Spinning/weaving Steam power		Root crops Selective breeding Rotation of crops	
1800 AD		Coal/coke Railways Steel ships			
1900 AD		Crude oil Internal combustion engine Turbines Cars Electricity		Artificial fertilizers Tractors	
2000 AD	Modern world				7.3%

Chapter 1 A Changing world - Where are we now?

Activity 4 Consequences of change worksheet 1

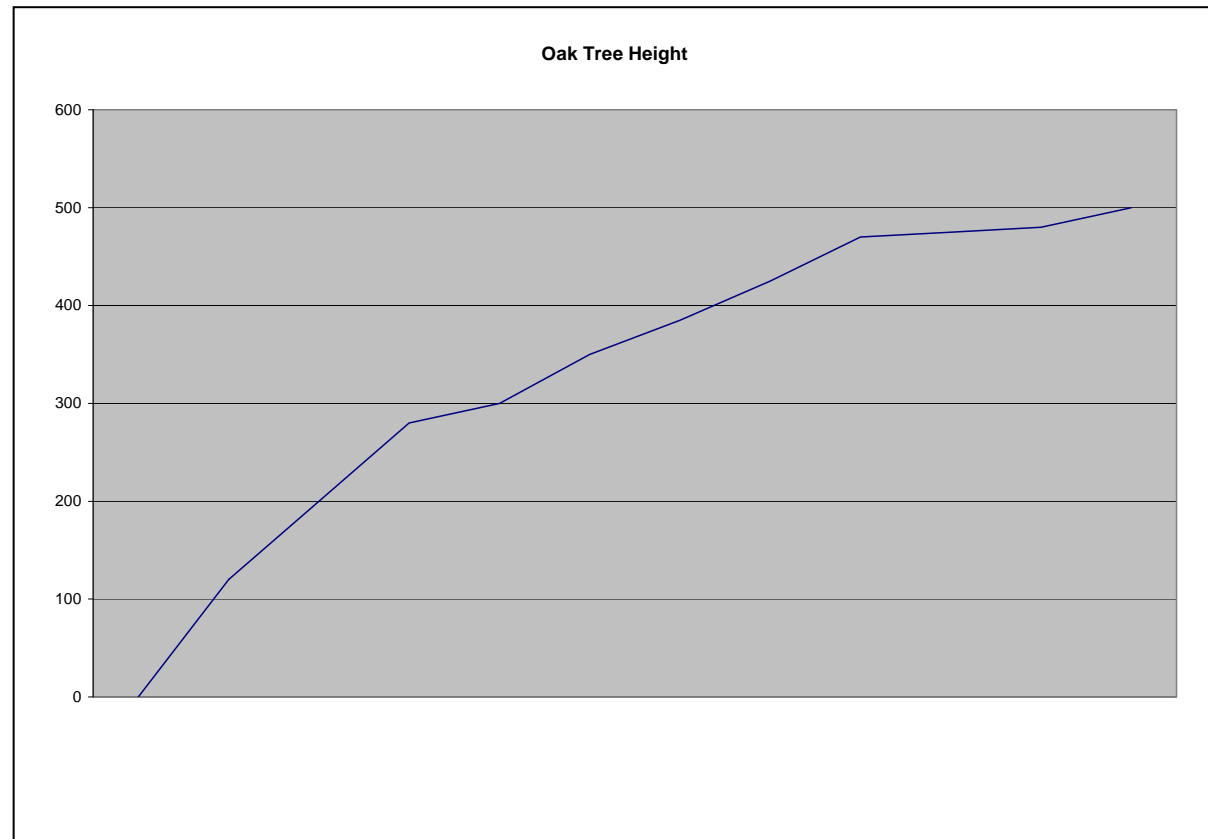
Understanding and explaining trends and changes over time

Task 1

A graph describes how **one thing changes in relation to another**.

An acorn was planted in the school grounds in 1950. By 1955 the tree was 50cm tall. The tree was measured every 5 years and the following results were recorded:

Year	Height of Tree (Cm)
1950	0
1955	120
1960	200
1965	280
1970	300
1975	350
1980	385
1985	425
1990	470
1995	475
2000	480
2005	500



Can you label the X axis?

Describe in words what the graph shows

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Chapter 1 A Changing world - Where are we now?

Activity 4 Consequences of change worksheet 2

Task 2

A Look at the following graphs which show general trends and changes which have occurred over different timescales.

B Select 1 of the following graphs and in your pairs study it in detail.

1. What does it show?
2. Why has this change occurred?
3. What are the positive and negative impacts of this change?

C Now look at all the graphs, and discuss the following questions for each one

1. What does it show?
2. Why has this change occurred?
3. What are the positive and negative impacts of this change?

D Can your group organise the graphs into 2 categories showing reversible and non –reversible changes?

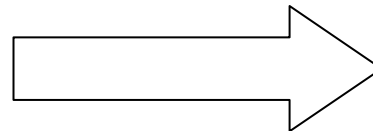
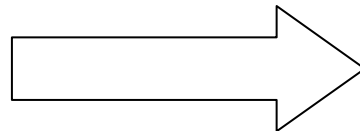
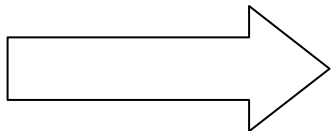
Discuss the reasons for your choices and be ready to explain your reasons to the rest of the class.

Task 3

Now think about how you could link all the graphs together.

Start with “population growth” and think about how and why this may have triggered other changes.

Use arrows to write your thoughts on how and why the different things are linked.



Chapter 1 A Changing world - Where are we now?
Activity 4 Consequences of change worksheet 3

