

## Curriculum mapping England // LESSON 1

- HISTORY**  
**KNOWLEDGE, SKILLS AND UNDERSTANDING**  
**CHRONOLOGICAL UNDERSTANDING**
- 1a Place events, people and changes into correct periods of time
  - 2a About characteristic features of the periods and societies studied
  - 2c To identify and describe reasons for, and results of, historical events, situations, and changes in the periods studied
- HISTORICAL ENQUIRY**
- 4a How to find out about the events, people and changes studied from an appropriate range of sources of information.
  - 4b To ask and answer questions, and to select and record information relevant to the focus of the enquiry
- ORGANISATION AND COMMUNICATION**
- 5a Recall, select and organise historical information
  - 5c Communicate their knowledge and understanding of history in a variety of ways
- CITIZENSHIP**
- 1a To talk and write about their opinions, and explain their views, on issues that affect themselves and society
  - 1c To face new challenges positively by collecting information, looking for help, making responsible choices, and taking action
  - 2a To research, discuss and debate topical issues, problems and events
  - 2d That there are different kinds of responsibilities, rights and duties at home, at school and in the community, and that these can sometimes conflict with each other
  - 2f To resolve differences by looking at alternatives, making decisions and explaining choices
  - 2h To recognise the role of voluntary, community and pressure groups
  - 2j That resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment

## Curriculum mapping Wales // LESSON 1

- HISTORY**  
**SKILLS**  
**CHRONOLOGICAL AWARENESS**
- Pupils should be given the opportunities to:
1. Use timelines to sequence events
- HISTORICAL KNOWLEDGE AND UNDERSTANDING**
- Pupils should be given opportunities to:
1. identify differences between ways of life at different times
  2. identify significant people and describe events within and across periods
  3. understand why people did things, what caused specific events and the consequences of those events
- INTERPRETATIONS OF HISTORY**
- Pupils should be given opportunities to:
1. identify the ways in which the past is represented and interpreted
  2. distinguish between 'fact' and 'opinion', giving some evidence/ knowledge-based reasons for this
- RANGE**  
**HISTORICAL ENQUIRY**
- Pupils should be given opportunities to:
1. ask and answer relevant questions about the past
  3. use a range of sources, including ICT
- ORGANISATION AND COMMUNICATION**
- Pupils should be given opportunities to:
2. communicate ideas, opinions and conclusions with increasing independence in a variety of ways, including ICT

## Curriculum mapping Scotland // LESSON 1

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 1

- THE WORLD AROUND US - HISTORY**  
**CHANGE OVER TIME**
- Pupils should be enabled to explore:
- How change is a feature of the human and natural world and may have consequences for our lives and the world around us;
  - Ways in which change occurs over both short and long periods of time in the physical and natural world
  - The effects of positive and negative changes globally and how we contribute to some of these changes

## Curriculum mapping England // LESSON 2

- KNOWLEDGE, SKILLS AND UNDERSTANDING**  
**CHRONOLOGICAL UNDERSTANDING**
- 1a Place events, people and changes into correct periods of time
  - 2a About characteristic features of the periods and societies studied, including the ideas, beliefs, attitudes and experiences of men, women and children in the past
  - 2c To identify and describe reasons for, and results of, historical events, situations, and changes in the periods studied
- HISTORICAL ENQUIRY**
- 4a How to find out about the events, people and changes studied from an appropriate range of sources of information, including ICT-based sources
  - 4b To ask and answer questions, and to select and record information relevant to the focus of the enquiry
- ORGANISATION AND COMMUNICATION**
- 5a Recall, select and organise historical information
  - 5c Communicate their knowledge and understanding of history in a variety of ways
- 1a To talk and write about their opinions, and explain their views, on issues that affect themselves and society
  - 1c To face new challenges positively by collecting information, looking for help, making responsible choices, and taking action
  - 2a To research, discuss and debate topical issues, problems and events
  - 2d That there are different kinds of responsibilities, rights and duties at home, at school and in the community, and that these can sometimes conflict with each other
  - 2j That resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment

## Curriculum mapping Wales // LESSON 2

- HISTORY**  
**SKILLS**  
**CHRONOLOGICAL AWARENESS**
- Pupils should be given the opportunities to:
1. Use timelines to sequence events
- HISTORICAL KNOWLEDGE AND UNDERSTANDING**
- Pupils should be given opportunities to:
1. identify differences between ways of life at different times

2. identify significant people and describe events within and across periods
  3. understand why people did things, what caused specific events and the consequences of those events
- INTERPRETATIONS OF HISTORY**
- Pupils should be given opportunities to:
1. identify the ways in which the past is represented and interpreted
  2. distinguish between 'fact' and 'opinion', giving some evidence/ knowledge-based reasons for this
- RANGE**  
**HISTORICAL ENQUIRY**
- Pupils should be given opportunities to:
1. ask and answer relevant questions about the past
  3. use a range of sources, including ICT
- ORGANISATION AND COMMUNICATION**
- Pupils should be given opportunities to:
2. communicate ideas, opinions and conclusions with increasing independence in a variety of ways, including ICT

## Curriculum mapping Scotland // LESSON 2

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 2

- THE WORLD AROUND US - HISTORY**  
**CHANGE OVER TIME**
- Pupils should be enabled to explore:
- How change is a feature of the human and natural world and may have consequences for our lives and the world around us
  - Ways in which change occurs over both short and long periods of time in the physical and natural world
  - The effects of positive and negative changes globally and how we contribute to some of these changes

## Curriculum mapping England // LESSON 3

- HISTORY**  
**KNOWLEDGE, SKILLS AND UNDERSTANDING**  
**CHRONOLOGICAL UNDERSTANDING**
- 1a Place events, people and changes into correct periods of time
  - 2a About characteristic features of the periods and societies studied, including the ideas, beliefs, attitudes and experiences of men, women and children in the past
  - 2c To identify and describe reasons for, and results of, historical events, situations, and changes in the periods studied
- HISTORICAL ENQUIRY**
- 4a How to find out about the events, people and changes studied from an appropriate range of sources of information
  - 4b To ask and answer questions, and to select and record information relevant to the focus of the enquiry
- ORGANISATION AND COMMUNICATION**
- 5a Recall, select and organise historical information
  - 5c Communicate their knowledge and understanding of history in a variety of ways
- ICT**  
**KNOWLEDGE, SKILLS AND UNDERSTANDING**
- 1a To talk about what information they need and how they can find and use it
  - 1b How to prepare information for development using ICT, including selecting suitable sources, finding information, classifying it and checking it for accuracy

## Curriculum mapping Wales // LESSON 3

- HISTORY**  
**SKILLS**  
**CHRONOLOGICAL AWARENESS**
- Pupils should be given the opportunities to:
1. Use timelines to sequence events
- HISTORICAL KNOWLEDGE AND UNDERSTANDING**
- Pupils should be given opportunities to:
1. identify differences between ways of life at different times
  2. identify significant people and describe events within and across periods
  3. understand why people did things, what caused specific events and the consequences of those events
- INTERPRETATIONS OF HISTORY**
- Pupils should be given opportunities to:
1. identify the ways in which the past is represented and interpreted
  2. distinguish between 'fact' and 'opinion', giving some evidence/ knowledge-based reasons for this
- RANGE**  
**HISTORICAL ENQUIRY**
2. plan the investigative approach to be used, suggesting how to find relevant information
  3. use a range of sources, including ICT
  4. reflect on their findings and the investigative approach used
- ORGANISATION AND COMMUNICATION**
- Pupils should be given opportunities to:
2. communicate ideas, opinions and conclusions with increasing independence in a variety of ways, including ICT

## Curriculum mapping Scotland // LESSON 3

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 3

- THE WORLD AROUND US - HISTORY**  
**CHANGE OVER TIME**
- Pupils should be enabled to explore:
- How change is a feature of the human and natural world and may have consequences for our lives and the world around us
  - Ways in which change occurs over both short and long periods of time in the physical and natural world
  - The effects of positive and negative changes globally and how we contribute to some of these changes

## Curriculum mapping England // LESSON 4

- SCIENCE, SC4 PHYSICAL PROCESSES**  
**ELECTRICITY**  
**LIGHT AND SOUND**
- 3 Pupils should be taught:
- EVERYDAY EFFECTS OF LIGHT**
- 3a That light travels from a source
  - 3c That light is reflected from surfaces
- BREADTH OF STUDY**
- 3.1a a range of domestic and environmental contexts that are familiar and of interest to them
  - 3.1b looking at the part science has played in the development of many useful things

- ENGLISH**  
**KNOWLEDGE, SKILLS AND UNDERSTANDING**  
**LISTENING**
- 2c To recall and represent important features of an argument, talk, reading, radio or television programme, film
  - 2d Identify features of language used for a specific purpose
- GROUP DISCUSSION AND INTERACTION**
- 3a To make contributions relevant to the topic and take turns in discussion
  - 3b Vary contributions to suite the activity and purpose, including exploratory and tentative comments where ideas are being collected together, and reasoned, evaluative comments as discussion moves to conclusions or actions
  - 3c Qualify or justify what they think after listening to others' questions or accounts
- BREADTH OF STUDY**
- 10a Investigating, selecting and sorting
  - 10c Explaining, reporting, evaluating

## Curriculum mapping Wales // LESSON 4

- SCIENCE**  
**SKILLS**  
**COMMUNICATION**
- Pupils should be given opportunities to:
1. search for, access and select relevant scientific information, from a range of sources, including ICT
  2. communicate clearly by speech, writing, drawings, diagrams, charts, tables, bar charts, line graphs, videos, and ICT packages, using relevant scientific vocabulary
- ENQUIRY**
- Pupils should be given opportunities to carry out different types of enquiry:
5. the observations or measurements that need to be made
- REFLECTING**
- Pupils think about what they have done in order to consolidate learning and transfer skills, knowledge and understanding to other contexts by:
1. beginning to evaluate outcomes against success criteria
  4. suggesting how the approach/method could have been improved
  5. describing how they have learned and identifying the ways that worked the best
- THE SUSTAINABLE EARTH**
- Pupils should use and develop their skills, knowledge and understanding by comparing the Earth with other planets, investigating materials around them and considering the importance of recycling
4. the properties of materials relating to their uses
- HOW THINGS WORK**
- Pupils should use and develop their skills, knowledge and understanding by investigating the science behind everyday things, the way they are constructed and work.
- They should be given opportunities to study:
1. the uses of electricity and its control in simple circuits
  5. how light travels and how this can be used

## Curriculum mapping Scotland // LESSON 4

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 4

- THE WORLD AROUND US - SCIENCE**  
**INTERDEPENDENCE**
- Pupils should be enabled to explore:
- The effect of people on the natural and built environment over time.
- MOVEMENT AND ENERGY**
- Pupils should be enabled to explore:
- Positive and negative consequences of movement and its impact on people, places and interdependence

## Curriculum mapping England // LESSON 5

- CITIZENSHIP**
- 1a To talk and write about their opinions, and explain their views, on issues that affect themselves and society
  - 1c To face new challenges positively by collecting information, looking for help, making responsible choices, and taking action
  - 1f To look after their money and realise that future wants and needs may be met through saving
- PREPARING TO PLAY AN ACTIVE ROLE AS CITIZENS**
- 2a To research, discuss and debate topical issues, problems and events
  - 2d That there are different kinds of responsibilities, rights and duties at home, at school and in the community, and that these can sometimes conflict with each other
  - 2f To resolve differences by looking at alternatives, making decisions and explaining choices
  - 2h To recognise the role of voluntary, community and pressure groups
  - 2j That resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment
- ENGLISH COMPOSITION**
- 1a Choose form and content to suit a particular purpose
  - 1b Broaden their vocabulary and use it in inventive ways
  - 1c Use language and style that are appropriate to the reader
  - 1d Use and adapt the features of a form of writing, drawing on their reading
  - 1e Use features of layout, presentation and organisation effectively
- PLANNING AND DRAFTING**
- To develop their writing on paper and on screen
- 2a Plan - note and develop initial ideas
  - 2b Draft - develop ideas from the plan into structured written text
  - 2c Revise - change and improve the draft
  - 2z Proofread - check the draft for spelling and punctuation errors, omissions and repetitions
  - 2e Present - prepare a neat, correct and clear final copy
  - 2f Discuss and evaluate their own and others' writing

## Curriculum mapping Wales // LESSON 5

- SCIENCE**  
**HOW THINGS WORK**
- Pupils should use and develop their skills, knowledge and understanding by investigating the science behind everyday things, the way they are constructed and work.
- They should be given opportunities to study:
5. how light travels and how this can be used

## Curriculum mapping Scotland // LESSON 5

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 5

THE WORLD AROUND US – SCIENCE

INTERDEPENDENCE

Pupils should be enabled to explore:

- Interdependence of people and the environment and how this has been accelerated over time by advances in transport and communications
- The effect of people on the natural and built environment over time.

MOVEMENT AND ENERGY

Pupils should be enabled to explore:

- Positive and negative consequences of movement and its impact on people, places and interdependence

## Curriculum mapping England // LESSON 6

CITIZENSHIP

1c To face new challenges positively by collecting information, looking for help, making responsible choices, and taking action

PREPARING TO PLAY AN ACTIVE ROLE AS CITIZENS

2a To research, discuss and debate topical issues, problems and events

2f To resolve differences by looking at alternatives, making decisions and explaining choices

ENGLISH COMPOSITION

1a Choose form and content to suit a particular purpose

1b Broaden their vocabulary and use it in inventive ways

1c Use language and style that are appropriate to the reader

1e Use features of layout, presentation and organisation effectively

ART

1a Record from experience and imagination, to select and record from first-hand observation and to explore ideas for different purposes

1c Collect visual and other information to help them develop their ideas, including using a sketchbook

INVESTIGATING AND MAKING ART, CRAFT AND DESIGN

2a Investigate and combine visual and tactile qualities of materials and processes and to match these qualities to the purpose of the work

2b Apply their experience of materials and processes, including drawing, developing their control of tools and techniques

2c Use a variety of methods and approaches to communicate observations, ideas and feelings, and to design and make images and artefacts

BREADTH OF STUDY

5a Exploring a range of starting points for practical work

5b Working on their own, and collaborating with others, on projects in two and three dimensions and on different scales.

5c Using a range of materials and processes

## Curriculum mapping Wales // LESSON 6

ART AND DESIGN

SKILLS

UNDERSTANDING

Pupils should be given opportunities to:

2. experiment with and examine the methods used by other artists, craftworkers and designers from different:
  - periods
  - places
  - cultures

INVESTIGATING

Pupils should be given opportunities to:

1. select and record from:
  - observation
  - experience
  - memory
  - imagination
2. investigate:
  - the natural environment
  - the made environment
  - the world of imagination using a variety of materials

MAKING

Pupils should be given opportunities to:

1. explore, experiment with and apply the elements of the visual, tactile and sensory language of art, craft and design

## Curriculum mapping Scotland // LESSON 6

ART AND DESIGN: First, Second, Third

## Curriculum mapping Northern Ireland // LESSON 6

ART AND DESIGN

SKILLS

UNDERSTANDING

Pupils should be enabled to:

2. experiment with and examine the methods used by other artists, craftworkers and designers from different:
  - periods
  - places
  - cultures

INVESTIGATING

Pupils should be given opportunities to:

1. select and record from:
  - observation
  - experience
  - memory
  - imagination
2. investigate:
  - the natural environment
  - the made environment
  - the world of imagination using a variety of materials

MAKING

Pupils should be given opportunities to:

1. explore, experiment with and apply the elements of the visual, tactile and sensory language of art, craft and design

## Curriculum mapping England // LESSON 7

ART

1a Record from experience and imagination, to select and record from first-hand observation and to explore ideas for different purposes

1c Collect visual and other information to help them develop their ideas, including using a sketchbook

INVESTIGATING AND MAKING ART, CRAFT AND DESIGN

2a Investigate and combine visual and tactile qualities of materials and processes and to match these qualities to the purpose of the work

2b Apply their experience of materials and processes, including drawing, developing their control of tools and techniques.

2c Use a variety of methods and approaches to communicate observations, ideas and feelings, and to design and make images and artefacts

BREADTH OF STUDY

5b Working on their own, and collaborating with others, on projects in two and three dimensions and on different scales

5c Using a range of materials and processes, including ICT

## Curriculum mapping Wales // lesson 7

ART AND DESIGN

SKILLS

UNDERSTANDING

Pupils should be given opportunities to:

2. experiment with and examine the methods used by other artists, craftworkers and designers from different:
  - periods
  - places
  - cultures

INVESTIGATING

Pupils should be given opportunities to:

1. select and record from:
  - observation
  - experience
  - memory
  - imagination
2. investigate:
  - the natural environment
  - the made environment
  - the world of imagination using a variety of materials

MAKING

Pupils should be given opportunities to:

1. explore, experiment with and apply the elements of the visual, tactile and sensory language of art, craft and design

## Curriculum mapping Scotland // LESSON 7

ART AND DESIGN: First, Second, Third

## Curriculum mapping Northern Ireland // LESSON 7

ART AND DESIGN

Pupils should be enabled to:

- develop their understanding of the visual elements of colour, tone, line, shape, form, space, texture and pattern to communicate their ideas
- use a range of media, materials, tools and processes such as: drawing, painting, printmaking, malleable materials, textiles and three-dimensional

## Curriculum mapping England // LESSON 8

CITIZENSHIP

1a To talk and write about their opinions, and explain their views, on issues that affect themselves and society

1c To face new challenges positively by collecting information, looking for help, making responsible choices, and taking action

1f To look after their money and realise that future wants and needs may be met through saving

2a To research, discuss and debate topical issues, problems and events

2d That there are different kinds of responsibilities, rights and duties at home, at school and in the community, and that these can sometimes conflict with each other.

2f To resolve differences by looking at alternatives, making decisions and explaining choices

2h To recognise the role of voluntary, community and pressure groups

2j That resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment

## Curriculum mapping Wales // LESSON 8

SCIENCE

INTERDEPENDENCE OF ORGANISMS

Pupils should use and develop their skills, knowledge and understanding by investigating how animals and plants are independent yet rely on each other for survival. They should be given opportunities to study:

7) how humans affect the local environment

THE SUSTAINABLE EARTH

Pupils should use and develop their skills, knowledge and understanding by comparing the Earth with other planets, investigating materials around them and considering the importance of recycling. They should be given opportunities to study:

6) a consideration of what waste is and what happens to local waste that can be recycled and that which cannot be recycled

## Curriculum mapping Scotland // LESSON 8

PEOPLE, PAST EVENTS AND SOCIETIES: First, Second

## Curriculum mapping Northern Ireland // LESSON 8

PERSONAL DEVELOPMENT AND MUTUAL UNDERSTANDING

Mutual understanding in the local and wider community

- initiating, developing and sustaining mutually satisfying relationships

- human rights and social responsibility

- causes of conflict and appropriate responses

- valuing and celebrating cultural difference and diversity

- playing an active and meaningful part in the life of the community and being concerned about the wider environment

## Curriculum mapping England // LESSON 9

ENGLISH COMPOSITION

1 Pupils should be taught to:

1a Choose form and content to suit a particular purpose

1b Broaden their vocabulary and use it in inventive ways

1c Use language and style that are appropriate to the reader

1d Use and adapt the features of a form of writing, drawing on their reading

1e Use features of layout, presentation and organisation effectively

PLANNING AND DRAFTING

To develop their writing on paper and on screen

2a Plan - note and develop initial ideas

2b Draft - develop ideas from the plan into structured written text

2c Revise - change and improve the draft

2d Proofread - check the draft for spelling and punctuation errors, omissions and repetitions

2e Present - prepare a neat, correct and clear final copy

2f Discuss and evaluate their own and others' writing

## Curriculum mapping Wales // LESSON 9

WRITING

RANGE

Pupils should be given opportunities to develop their writing skills through:

1. writing for a range of purposes
2. writing for a range of real or imagined audiences
3. writing in a range of forms
4. writing in response to a wide range of stimuli: visual, audio and written

## Curriculum mapping Scotland // LESSON 9

WRITING, CREATING TEXTS: First, Second

## Curriculum mapping Northern Ireland // LESSON 9

LANGUAGE AND LITERACY

WRITING

Pupils should be enabled to:

- participate in modelled, shared, guided and independent writing, including composing on-screen
- experiment with rhymes, rhythms, verse structure and all kinds of word play and dialect;
- write for a variety of purposes and audiences, selecting, planning and using appropriate style and form
- express thoughts, feelings and opinions in imaginative and factual writing
- use a variety of stylistic features to create mood and effect

## Curriculum mapping England // LESSON 10

SCIENTIFIC ENQUIRY

1a That science is about thinking creatively to try to explain how living and non-living things work, and to establish links between causes and effects

1b That it is important to test ideas using evidence from observation and measurement

PLANNING

2a Ask questions that can be investigated scientifically and decide how to find answers

2b Consider what sources of information, including first-hand experience and a range of other sources, they will use to answer questions

2c Think about what might happen or try things out when deciding what to do, what kind of evidence to collect, and what equipment and materials to use

2d Make a fair test or comparison by changing one factor and observing or measuring the effect while keeping other factors the same

2e Use simple equipment and materials appropriately and take action to control risks

2g Check observations and measurements by repeating them where appropriate

2i Make comparisons and identify simple patterns or associations in their own observations and measurements or other data

2j Use observations, measurements or other data to draw conclusions

2k Decide whether these conclusions agree with any prediction made and/or whether they enable further predictions to be made

2l Use their scientific knowledge and understanding to explain observations, measurements or other data or conclusions

2m Review their work and the work of others and describe its significance and limitations

ELECTRICITY

1a To construct circuits, incorporating a battery or power supply and a range of switches, to make electrical devices work

1b How changing the number or type of components in a series circuit can make bulbs brighter or dimmer

1c How to represent series circuits by drawings and conventional symbols, and how to construct series circuits on the basis of drawings and diagrams using conventional symbols

3a That light travels from a source

3c That light is reflected from surfaces

COMMUNICATION

2a Use appropriate scientific language and terms, including SI units of measurement [for example, metre, newton], to communicate ideas and explain the behaviour of living things, materials, phenomena and processes

HEALTH AND SAFETY

2b Recognise that there are hazards in living things, materials and physical processes, and assess risks and take action to reduce risks to themselves and others

2i Make comparisons and identify simple patterns or associations in their own observations and measurements or other data

2j Use observations, measurements or other data to draw conclusions

2k Decide whether these conclusions agree with any prediction made and/or whether they enable further predictions to be made

2l Use their scientific knowledge and understanding to explain observations, measurements or other data or conclusions

2m Review their work and the work of others and describe its significance and limitations

## Curriculum mapping Wales // LESSON 10

SCIENCE

SKILLS

COMMUNICATION

Pupils should be given opportunities to:

1. search for, access and select relevant scientific information, from a range of sources, including ICT

2. communicate clearly by speech, writing, drawings, diagrams, charts, tables, bar charts, line graphs, videos, and ICT packages, using relevant scientific vocabulary

ENQUIRY

Pupils should be given opportunities to carry out different types of enquiry,

5. the observations or measurements that need to be made

REFLECTING

Pupils think about what they have done in order to consolidate learning and transfer skills, knowledge and understanding to other contexts by:

1. beginning to evaluate outcomes against success criteria

4. suggesting how the approach/method could have been improved

5. describing how they have learned and identifying the ways that worked the best

The sustainable Earth.

Pupils should use and develop their skills, knowledge and understanding by comparing the Earth with other planets,

investigating materials around them and considering the importance of recycling.

4. the properties of materials relating to their uses

How things work

Pupils should use and develop their skills, knowledge and understanding by investigating the science behind everyday things, the way they are constructed and work.

They should be given opportunities to study:

1. the uses of electricity and its control in simple circuits
5. how light travels and how this can be used

## **Curriculum mapping Scotland // LESSON 10**

FORCES, ELECTRICITY AND WAVES: Early, First, Second

## **Curriculum mapping Northern Ireland // LESSON 10**

THE WORLD AROUND US – SCIENCE

INTERDEPENDENCE

Pupils should be enabled to explore:

- Interdependence of people and the environment and how this has been accelerated over time by advances in transport and communications
- The effect of people on the natural and built environment over time.

MOVEMENT AND ENERGY

Pupils should be enabled to explore:

- How movement can be accelerated by human and natural events such as wars, earthquakes, famine or floods
- Positive and negative consequences of movement and its impact on people, places and interdependence



## Lesson 1: Invention of the light bulb

In this activity, pupils explore the history surrounding the development of the light bulb and the role Thomas Edison played in its creation.

### PREPARATION

Photocopy the information page *The historic race to make-a-better-bulb* for each pupil. Photocopy the activity sheet *Invention of the light bulb* for each pupil.

### LESSON

Ask your class to think about the humble, unassuming light bulb, an everyday object that passes without comment – until it doesn't work. The light bulb has been vitally important in the provision of light in modern times. Ask your pupils to talk about what they know about the invention of the light bulb. Do they know who invented it? How it was discovered or what came before?

Explain that the lesson will focus on the invention of the light bulb.

After the initial discussion, hand out the information page *The historic race to make-a-better-bulb*. The objective is to ask pupils to highlight key points and dates in the history of the light bulb as they read it, so they will be able to work on the activity sheet *Invention of the light bulb*. The information garnered from the information page will support the activity of creating a timeline that highlights key stages in the development of the light bulb. Encourage children to identify the key points so that they can be recorded succinctly, rather than copying huge chunks of text on to their timeline.

The information page concludes with Edison's involvement but that is not the end of the story. Ask pupils to research what happened next in the history of the light bulb, including the development and introduction of new low energy light bulbs. Now their timelines can be brought right up to date and extended to include future plans, such as the phasing out of ordinary light bulbs. The 100W bulb has already been withdrawn and the rest will follow in 2012.

### PLENARY

Ask the class to identify what they have learned about the history of light bulbs. How has the light bulb changed our lives? Ask children to imagine what would have happened if the light bulb had never been invented.

### LEARNING OUTCOMES

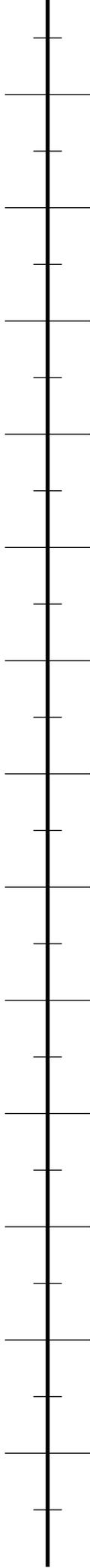
- To understand that Edison is credited with creating the first electric light bulb
- To understand that creation of the electric light bulb was quite a long process
- To skim or scan to identify key points in a text

**Curriculum links**  
**PSHE, History**

# Invention of the light bulb



Draw a timeline to show the important events that happened in the creation of the light bulb.  
Use the information page *The historic race to make-a-better-bulb* to help you pick out key dates and events.



# Invention of the light bulb



How has the light bulb changed since it was first created?

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What do you think will happen to light bulbs in the future?

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# The historic race to make-a-better-bulb

**W**ho invented the light bulb? It was Thomas Edison in 1879, wasn't it? That's what many people think and that's what is recorded in many places. Like most stories, however, there is a lot more behind this important invention than Mr Edison would have us believe.

The story of the light bulb really starts 70 years earlier.

In 1809 an Englishman, Humphry Davy, demonstrated a powerful electric lamp to the Royal Society in London. Davy's lamp produced its light by creating a blinding electric spark between two charcoal rods. This device, known as an 'arc lamp' was impractical for most uses because the light was simply too bright. The device also needed a huge power source and the batteries, which powered Davy's demonstration model, were drained quickly.

Back then, in the 19th century, other scientists thought that a completely new technique for making electric light held more promise.

The new method of generating light was known as 'incandescence'. Scientists knew that if you took some materials and passed enough electricity through them, they would heat up. Also, they knew that if the material got hot enough, it would start to glow and therefore give off light. This method had a problem though, because often the material would either burst into flames or melt into a puddle! If an incandescent light was to be made practical, both these problems had to be resolved.

Inventors discovered that one way to keep incandescent 'burners' from catching fire was to stop them being in contact with oxygen. Since oxygen is in the atmosphere, the only way to keep it away from the burners was to enclose the burner in a glass container, or 'bulb', and pump out the air. In 1841, a British inventor, named Frederick DeMoleyns, created a bulb using just this technique.

It was obvious that incandescent lighting would be a huge financial success if it could be perfected, so many inventors continued to work on finding a solution.

So did Edison invent the light bulb? Not exactly.

In 1850 Joseph Swan, an English physicist and chemist, began working on a light bulb using carbonised paper filaments in a glass bulb with no oxygen. By 1860 he was able to demonstrate a working model and obtained a British patent.



# The historic race to make-a-better-bulb

Fifteen years went by while Joseph Swan tried to perfect his invention and he eventually received another patent for the incandescent light bulb in 1878. His house in Gateshead was the first in the world to be lit by a light bulb. In 1881 he started his own company, The Swan Electric Light Company, and started commercial production.

In America Thomas Edison had been working on copies of the original Swan design and also tried to register a patent. However the patent dates prove who won the race! Joseph Swan sued Thomas Edison and won. The British Courts forced Edison, as part of the settlement, to make Swan a partner in his company. Eventually Edison managed to acquire all of Swan's interest in the newly renamed Edison and Swan United Electric Company.

By 1882 Thomas Edison had established the Edison Electric Light Company in New York, which had a generating station, providing New York City with electric lighting. In 1883 the department store, Macy's, in New York became the first shop to install the new incandescent lamps.

Edison was extremely successful in setting up a system of power distribution in the city and selling the light bulbs that used this electricity! Within 10 years Edison had three million customers.

And the rest, as they say, is history!



## Lesson 2: What the light bulb achieves for us

In this activity, pupils consider how the light bulb has changed our lives for the better and what life would be like without it.

### PREPARATION

Photocopy *What the light bulb achieves for us* activity sheet for each pupil.

### LESSON

Ask pupils to think of all the things that light bulbs make possible, such as reading in bed at night, watching evening football matches in winter and so on. They must think about what would happen to all these activities without light bulbs and whether or not there is an alternative solution. If there is, what would be the disadvantages, for example, without light bulbs we'd need candles to read in bed at night and candles could cause a fire.

Hand out the activity sheet *What the light bulb achieves for us* and ask pupils to list as many activities as possible that they think would be difficult or impossible to do without light bulbs. Now challenge them to come up with a possible solution for each activity and explain its disadvantages. Pupils can work in pairs or groups.

Discuss some of the activities, solutions and disadvantages that the class come up with.

Once this lesson is complete, suggest pupils design a poster showing why the light bulb is a great invention and should be celebrated.

### PLENARY

Of all the activities that pupils have considered, discuss which they would miss the most and why? Ask pupils to share their poster designs — or make a display on the classroom wall and ask a colleague to judge the best ones — and talk about why they think light bulbs were a significant invention.

### LEARNING OUTCOMES

- To understand how the light bulb affects our lives
- To appreciate all the things that electric light makes possible

**Curriculum links**  
**PSHE, History**



# What the light bulb achieves for us

In the table, write down things you do – or that your family and friends do – that depend on light bulbs. Write what would have to happen if light bulbs had not been invented and what the disadvantages would be of the alternative solutions. Two examples are given to help you start.

ACTIVITY	WHAT WOULD HAPPEN WITHOUT A LIGHT BULB?	WHY IS THAT A DISADVANTAGE?
Reading in bed	Need to use a candle	Fire risk
Winter evening football matches	Cancelled or postponed until summer	

Design a poster showing all the things you can do because of a light bulb. Show as many different things as you can to show why we should celebrate the invention of the light bulb!



## Lesson 3: Lighting: Then and now

In this activity, the pupils will consider how lighting was used in the past, in some work places, and how modern lighting would have done a much better job.

### PREPARATION

Photocopy the activity sheet *Lighting: Then and now* for each pupil.

### LESSON

Explain to your class that they are going to think about working conditions from the past. Talk about jobs that they know about where bright or artificial light is very important. Consider which of these jobs, if any, were also undertaken in the past and how artificial lighting was supplied.

Hand out the activity sheet *Lighting: Then and now* and read through it as a class. Talk about the jobs from the past that are listed on the activity sheet – mill worker, accountant and miner – and the light sources available then. Discuss the limitations of these sources and how these jobs were made more difficult, as well as any potential health implications.

Ask pupils to use the internet and other information sources to find out how those jobs are carried out today. They should note their findings on the activity sheet and discuss how the lighting has changed. Has this improved those working conditions?

### PLENARY

Ask pupils to talk about what they have learned about the improvement in working conditions since the availability of the light bulb. Do they think conditions will continue to improve in the future? What do they think will make this possible?

### LEARNING OUTCOMES

- To understand that lighting has changed considerably over time
- To appreciate how the changes in lighting have improved working conditions

### Curriculum links

**History, ICT**

# Lighting: Then and now



THEN	NOW
<p>A mill in Northern England where, at the age of 12 or 13, young people would be expected to work in spinning and weaving mills from dawn to dusk under fairly harsh conditions. Oil lamps, gas lighting and natural daylight were the main types of lighting in use in 1885.</p>	
<p>An accountant or bookkeeper from Victorian or Edwardian times would have to work by daylight or candlelight.</p>	
<p>An early miner would have to use a davy lamp to see when working underground.</p>	

# Lighting: Then and now



What would it have been like to work under these conditions?

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How would their working space look now?

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How does this improve their working conditions?

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## Lesson 4: Different sources of light

In this activity, pupils review their knowledge of light sources and the wide variety that are available.

### PREPARATION

Photocopy the activity sheet *Different sources of light* for each pupil.

### LESSON

Ask the class to think about where light comes from, both natural and artificial sources. How many sources can they name?

Hand out the activity sheet *Different sources of light* and ask pupils to identify which of the pictures are actual light sources and which are not, (mirror and moon are not light sources). Ask pupils to identify those that are not light sources and discuss why these objects do not belong in this group. What is it that they do? (They reflect light from other sources rather than produce their own.)

Ask pupils to complete the remainder of the activity. Review a selection of answers from the class. Discuss the range of light sources they identified and how they are used. Encourage pupils to explain reasons for their choices. Are some sources more useful than others?

Instruct pupils to get into groups and discuss which source is the most useful and why. Ask them to create a mini-presentation, only a few minutes long, to put forward their argument for the most useful light source.

### PLENARY

Watch the mini-presentations and take a vote as a class to find the most useful light source.

### LEARNING OUTCOMES

- To understand that there are lots of different sources of light
- To be aware that some objects do not have their own source of light, but reflect light from another source and, therefore, are not light sources

**Curriculum links**  
**Science, English**

# Different sources of light



Look at the pictures. Which two are not sources of light?

Draw them here:

Two large, empty rectangular boxes with thick black borders, intended for drawing the two items that are not sources of light.

Explain why they don't belong in this group.

The \_\_\_\_\_ and the \_\_\_\_\_ do not belong in this group because \_\_\_\_\_

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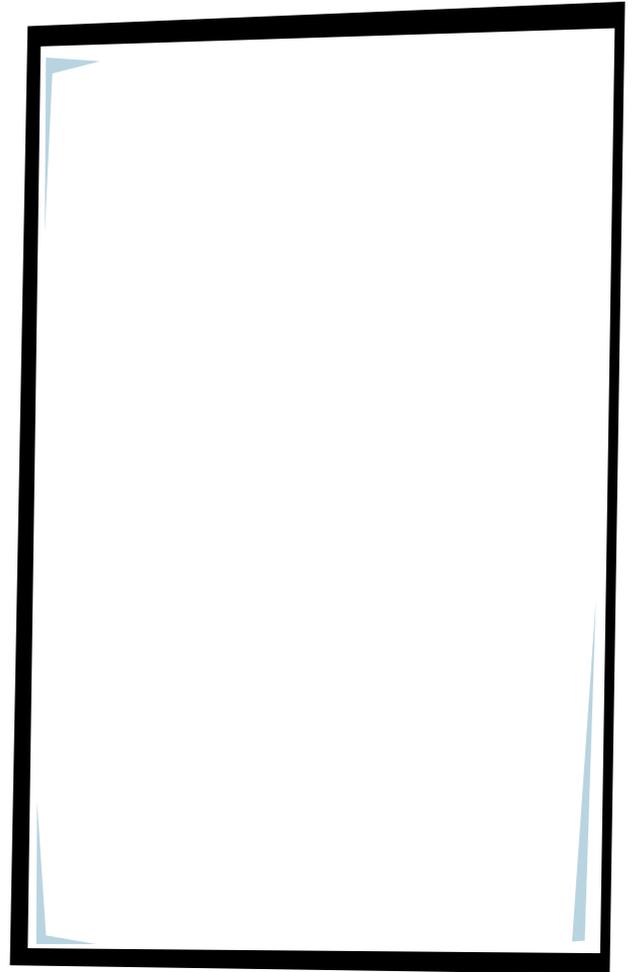
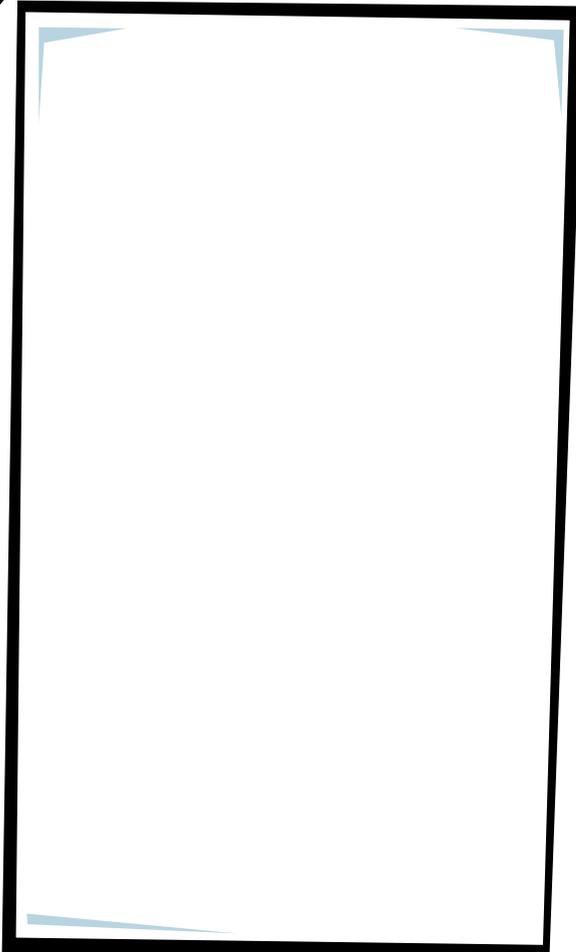
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# Different sources of light



Now think about real sources of light, can you think of any others?

Draw them here:



Explain why they belong in this group.

The \_\_\_\_\_ and the \_\_\_\_\_ belong in this group because \_\_\_\_\_

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## Lesson 5: Light is all around

In this activity, the pupils are challenged to think of all the different types and uses of lights we have in the world today.

### PREPARATION

Photocopy the activity sheet *Light is all around* for each pupil.

### LESSON

Explain to pupils that they are going to be asked to think about the different types of light that there are and their uses. Recap the previous lesson where they discussed different light sources.

Choose one type of light as a starting example, *eg* sunlight, and ask the pupils to list as many different uses for it as they can. Create the class list on the board.

Now hand out the activity sheet *Light is all around*, ask pupils to come up with as many different uses for each light-type as possible. Encourage pupils to think about domestic use and environmental use. Now ask them to think of their own light sources in the spaces provided and list all their uses. Explain that they have to think of as many different uses as they can.

Choose one or two headings and compile a class list, making sure everyone realises that working together produces effective results. How many new ideas can everyone come up with? Who has the longest list?

### PLENARY

Challenge pupils to take their lists home and try to add to them. Offer a prize or incentive for the pupil who can compile the longest list.

### LEARNING OUTCOMES

- To think about light and its many uses
- To compile information in the form of a list

### Curriculum links

English, Thinking skills, PSHE

# Light is all around

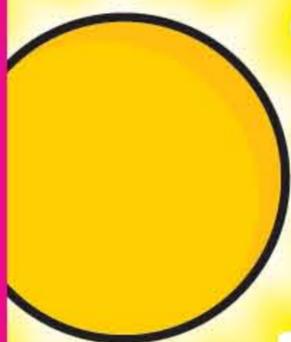


How many different sorts of light can you think of? Start with lamp and candle and write down the many different ways they can be used then add your own ideas in the spaces provided.

<b>SOURCE: LAMP</b>	<b>SOURCE: CANDLE</b>
USES	USES
<b>SOURCE:</b>	<b>SOURCE:</b>
USES	USES

Can you write the longest list in your class?

**Light is something we all take for granted. We flick a switch and a light comes on. But it hasn't always been that easy. Come with me as I journey back through time and enlighten you. Remember you have a big part to play in protecting our planet.**



**Natural light –**  
it takes light 8 minutes to reach the earth from the sun. In 15 minutes our sun makes as much energy as we use in a whole year!



**400,000 BC**  
Man discovered fire, probably by accident.



**13,000 BC**  
The basic torch – a bundle of sticks tied together were the first portable lamp.



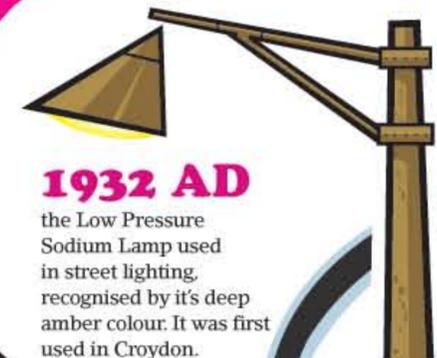
**400 AD**  
Expensive candles were made from beeswax and were used in churches. Ordinary people used cheaper ones, which was smelly and smoky.



**1666 AD**  
Isaac Newton discovered that white light is made up from a spectrum of seven colours.



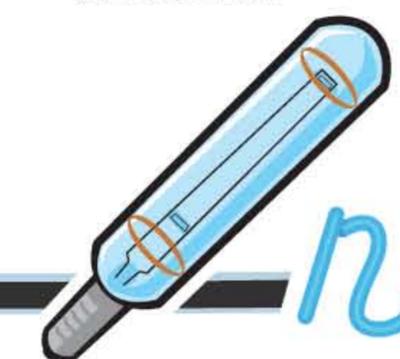
**1809 AD**  
Sir Humphrey Davy invented the Arc light.



**1932 AD**  
the Low Pressure Sodium Lamp used in street lighting, recognised by its deep amber colour. It was first used in Croydon.



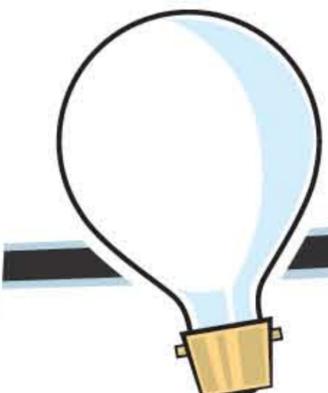
**1913 AD**  
Gas filled lamps were the next development of the light bulb which gave a much brighter light.



**1901 AD**  
Mercury lamps developed as an alternative to the electric filament light bulb. Versions exist today – known as low energy light bulbs!

*neon*

**1898 AD**  
Neon was discovered in 1898 – when electricity is passed through neon gas, it glows bright red!



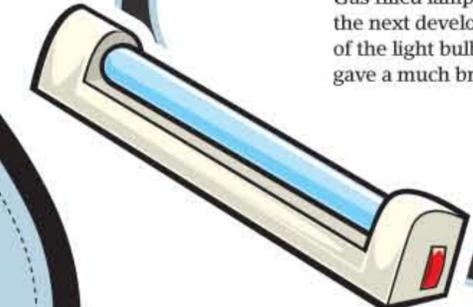
**1879 AD**  
Thomas Edison claimed he invented the light bulb but it was actually Joseph Swan. Edison bought Swan's idea.



**1849 AD**  
How fast is the speed of light? A ray of light travels 8 times around the world in under a minute! Nothing is faster than the speed of light!



**1814 AD**  
London streets were lit by gas lights. Theatres also started using gas lighting.



**1937 AD**  
The fluorescent lamp was the early modern low energy lamp which are simply folded fluorescent tubes!



**1955 AD**  
Lasers are used for surgery, cutting metal, measuring distance, computer printing and many lighting applications.



**1955 AD**  
Fibre optics are used for things like broadband and telephone services.



**1983 AD**  
Low energy light bulbs can last up to 5 years, save a lot of money and are better for the environment. By 2014 this will be the only kind of light bulb you can buy.

**RecOlight**  
Making lamp recycling happen!

**2005 AD**  
An organisation called Recolight was founded to promote and manage the recycling of the new low energy light bulbs.

**Sainsbury's**

**2010 AD**  
Sainsbury's have recycling receptacles at local stores for low energy light bulbs.

