

Instituto Español “Vicente Cañada Blanch”

PROGRAMME OF STUDY 2019-2020

Social Science: Year 4 Primary

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Prepared by Fourth Grade Social Studies Teachers

EVALUATION CRITERIA

- Direct, continuous and systematical observation. We will particularly take into account daily class participation, good school habits, knowledge of content, and interest.
- Analysis of worksheets, notebooks and other materials.
- Oral questions, debates and general exchange.
- There will also be specific testing for each unit.
- And also research work, summaries, concept maps will be taken by us into account.

EVALUATION CRITERIA	EVALUATION TOOLS
Knowledge of content (test, questions in class, assignments) 70 %	Test assessment
Class assignments 10% Organization Completion of tasks in notebook Projects	Self-evaluation. Class activities register Materials register Homework grading register.
Homework 10%	Our own register of completed homework Group evaluation – team work assessment
Correct school attitude: participation, collaboration, effort. 10%	Class register

CROSS CURRICULAR CONTENT TO ADDRESS THROUGHOUT THE SCHOOL YEAR

BRITISH VALUES	PROTECTED CHARACTERISTICS
<ul style="list-style-type: none">• Democracy:• The rule of law• Individual Liberty• Mutual respect for the tolerance of those with different faiths and beliefs and for those without faith	<ul style="list-style-type: none">• Sex• Race• Religion or belief• Disability• Gender reassignment• Pregnancy and maternity• Disability

Unit 1 Population

About the unit

This unit focuses on the theme of development. The concept is difficult and care will be needed in pitching the activities appropriately for pupils of differing abilities. One way of doing this may be to focus initially and repeatedly on development issues within pupils' own experiences.

Pupils are asked to consider *What is development?* and their perceptions of familiar places. They use a range of indicators to analyse world patterns of development and go on to evaluate the effectiveness of similar indicators in assessing the quality of life of different people in particular locations. By participating in a trade game they consider the impact of trade between more economically developed countries (MEDCs) and less economically developed countries (LEDCs) on the latter, from different perspectives. The unit ends with an investigation of the Department for International Development's development cooperation policy.

The whole unit makes a substantial contribution to citizenship. Pupils are encouraged to clarify their own values and attitudes and to consider how other people's values and attitudes affect contemporary issues.

The unit is expected to take 12 hours.

Key aspects

Geographical enquiry and skills

Pupils will:

- ask geographical questions
- analyse evidence and draw conclusions
- appreciate values and attitudes
- use extended geographical vocabulary
- use atlases/globes/maps
- use secondary evidence
- communicate, including using ICT

Knowledge and understanding of places

Pupils will:

- locate places and environments
- describe scale contexts
- describe and explain physical and human features
- explore interdependence and global citizenship

Knowledge and understanding of patterns and processes

Explored through:

- development

Knowledge and understanding of environmental change and sustainable development

Pupils will study:

- sustainable development

What is development? What factors do we need to consider?

OBJECTIVES	ACTIVITIES	EVALUATION	LEARNING COMPETENCES
<ul style="list-style-type: none"> • • to consolidate understanding of geographical vocabulary • • to use an atlas to locate places studied • • to identify geographical questions and issues • • to use secondary sources of evidence, including photographs • • to think critically about the concept of 'development' • • to describe and explain the physical and human features that give rise to the distinctive character of places • • to consider the effects of differences in development on the quality of life of different groups of people • • to appreciate how places are linked 	<ul style="list-style-type: none"> • • Help pupils to recall what they understand by the term 'development' (previous work might include unit 9 'Shopping – past, present and future' and unit 11 'Investigating Brazil' or another LEDC). Try to write an agreed definition of development on the board and discuss why this proves to be difficult. • • Organise a class brainstorming activity about any development issue in the school's locality. As a stimulus use appropriate clippings from a local newspaper; place the cuttings in the centre of a large piece of paper and ask pupils to highlight key questions and different views about the issue. • • Provide pupils with photographs of two contrasting localities (one from an LEDC and another from somewhere in the UK). Ask pupils to use an atlas to locate the places being studied. Ask them to analyse the two photographs using the development compass rose framework (Natural environment (N); Economic (E); Social (S) and Who decides? – political (W)). Then ask them to reflect on their analyses. <i>Are there questions in common? What are the main differences between their questions about the two localities? What experiences might people living in the two places have in common?</i> • • Provide pupils with a set of photographs portraying different images of the same place, <i>eg São Paulo</i>. Ask pupils to generate their own geographical enquiry questions for investigation and then to answer them, <i>eg Where is this place? What is this place like? What do people experience in this place? What messages do the photographs give? Do they tell the whole story about it?</i> (see unit 12 'Images of a country'). • • Using the development compass rose framework, ask pupils to chart any links they can identify between their school's local area and other parts of the world. (Previous work might include unit 1 'Making connections', unit 11 'Investigating Brazil', unit 14 'Can the earth cope?'.) • • Organise a class debriefing to consider such questions as <i>If the rest of the world was not there, how would things be different in the UK? In what ways do we, as UK residents, affect life in other parts of the world?</i> 	<ul style="list-style-type: none"> • • explain why it is difficult to agree a definition of 'development' in a geographical context • • identify development issues in the school's local area • • generate their own appropriate geographical enquiry questions • • analyse photographs of contrasting localities to identify similarities and differences in the quality of life of residents • • explain how development occurs at different scales and in all localities • • describe and explain how countries are linked in a global context 	<ul style="list-style-type: none"> • • PSHE: this activity provides opportunities for pupils to show respect for the differences between people. • • The development compass rose framework might be a useful way for pupils to record their notes.

What is development? How do we measure development and identify differences?

OBJECTIVES	ACTIVITIES	EVALUATION	COMPETENCES
<ul style="list-style-type: none"> • • to use an extended geographical vocabulary • • to select and use secondary sources of evidence • • to select and use appropriate graphical techniques to present evidence, including ICT • • to identify patterns/differences in development within and between countries through the use and analysis of a series of indicators • • to consider the effects of differences in development on the quality of life of different groups of people within a country and in different countries/geographical contexts • • to consider the factors/processes, including the interdependence of countries, that influence development or lack of development. 	<ul style="list-style-type: none"> • • Provide pupils with a selection of statistical charts and maps (including topographical maps or access to a mapping package/GIS with similar data), which show world patterns of development. Ask pupils to study the data carefully and to note what it shows. Ask them about their initial reactions to the patterns they identify. • • Introduce pupils to a variety of development indicators, <i>eg GNP, GDP, HDI, and measures, eg life expectancy, education enrolment, educational attainment, real GDP per capita, GDI</i>. Ask pupils to transform the data into a variety of charts/diagrams/maps, appropriate to their abilities. This activity provides an opportunity to introduce techniques of measuring relationships/correlating variables. A range of development indicators can be provided in a mapping package/GIS. Pupils can search for patterns or classify the data and look for relationships. This can be achieved in different ways, <i>eg best for MEDCs, best for LEDCs, economic, social</i>. As a summary, ask pupils to record and justify the four indicators they think will be most useful for showing the world pattern of development. • • Discuss with pupils the terms MEDC and LEDC. Ask them to assess how these two groups of countries are represented by the indicators. How might different groups of people interpret these terms? • • Through a selection of case studies help pupils to explore what the development indicator statistics might mean for different people in particular localities, <i>eg Are the experiences of some people more visible than those of others? Are there dangers of generalising and, therefore, of stereotyping people from particular places? Are economic measures necessarily a good indicator of 'quality of life'?</i> • • Organise pupils into groups to carry out choropleth mapping exercises which use a range of indicators at different scales, <i>eg local (such as wards in a city), national (different regions), and European and global (different countries)</i>. Ask each group to present their maps, talk about the indicators they have used and describe and attempt to explain the patterns their maps show. Ask them also to reflect on the usefulness/level of accuracy of the maps as a means of displaying the information. Alternatively, if a mapping package/GIS with a range of maps and related data is available, ask pupils to establish a series of enquiries and then predict and plot the distribution of key indicators. Pupils can then identify countries or areas which match predicted relationships and plot an indicator(s) which enables them to answer the enquiry. 	<ul style="list-style-type: none"> • • identify, describe and attempt to explain patterns of development at various scales • • transform development statistics into maps and diagrams • • evaluate the usefulness of indicators and terms used • • describe and explain what development might mean to different groups of people within a country and for producers and consumers in countries at different states of development • • suggest reasons for differences in development at different scales and in different contexts • • evaluate the contribution made by a particular TNC or development organisation to development in an LEDC (higher-attaining pupils) 	<ul style="list-style-type: none"> • • ICT: this activity provides pupils with the opportunity to use ICT to analyse information using a mapping package or GIS. If such software is not available, providing the data in a spreadsheet where pupils can be in control of ranking and graphing the data provides a powerful technique for analysis. • • To make the work meaningful for pupils use real situations and case studies wherever possible. • • Mathematics: pupils interpret data, make comparisons and draw inferences, and begin to understand correlation. • • ICT: as an extension activity pupils could access additional case study material via the internet, <i>eg information about particular TNCs and development organisations</i>.

What is development? Why are different perspectives important?

OBJECTIVES	ACTIVITIES	EVALUATION	COMPETENCES
<ul style="list-style-type: none"> • to appreciate how people's values and attitudes, including their own, affect contemporary social, economic and political issues, and to clarify and develop their own values and attitudes about such issues • to use secondary sources of evidence • to explore the idea of sustainable development and recognise its implications for people, places and environments and for their own lives 	<ul style="list-style-type: none"> • Carry out a 'myth busting' activity with the whole class to help pupils reflect on what they have learnt, <i>eg an 'Are the statements true or false?' exercise about world hunger which explores both the physical and human aspects of the issue</i>. Ask them to make a note of key information. • Organise pupils into groups. Provide each group with a collection of cartoons/set of photographs which has a development focus. Ask each group to select three cartoons/photographs which, from the group's viewpoint, highlight something important about development. Use the responses to conduct a class discussion about development and its inequalities. Ask pupils to make notes during the presentations for use in the synthesising exercise below. • Teach pupils about the government's DfID development cooperation policy, which not only considers aid but also its quality. Discuss with pupils what priorities they would propose for development cooperation. <i>How do they think the UN 2015 targets could be met? What changes would they like to see happening in the world? What might the implications be for them in their lives? How different are their views about development now?</i> • As a synthesising exercise help pupils to plan a piece of written work that might take the form of a report for a radio programme entitled 'Development – how I would try to rid the world of its inequalities' or 'Development – how I would make the world a fairer place for everyone'. Suggest to pupils that they explain the term 'development', select five or six key actions, prioritise them and justify their particular choices; they should end by stating how the proposed actions will affect their own lives. It may be helpful if the selection and prioritising of action points are conducted in groups, followed by group presentations to the whole class, during which pupils have an opportunity to make notes prior to writing their reports. This strategy will provide support for lower-attaining pupils. 	<ul style="list-style-type: none"> • question and challenge some commonly held views about development • identify factors that contribute to differences in development and resulting inequalities • reflect on how their actions might help or hinder development in other countries • select and justify possible actions to reduce inequalities on a global scale and present them clearly in speaking and writing • explain how people's values and attitudes, including their own, affect development issues 	<ul style="list-style-type: none"> • The summary edition of the DfID White Paper <i>Eliminating world poverty: a challenge for the 21st century</i> provides a very readable overview of an approach to development cooperation, highlighting environmental sustainability, political stability, the prevention of conflict and financial issues such as debt, as well as aid. • Language for learning: a group activity provides pupils with the opportunity to follow an argument or demonstration, making notes which are then used in another task. • Language for learning: this synthesising activity provides the opportunity for pupils to ask different sorts of questions to extend thinking and refine ideas. Pupils could also organise content into a whole piece with the relationship between points and paragraphs clearly signalled, and structure paragraphs to develop points, by using evidence and additional facts. • Key skills: links with working with others, where pupils work on a one-to-one or group basis and plan with others what needs to be done, confirm their understanding of the objectives, their responsibilities and working arrangements, and carry out tasks and review progress.

Unit 2 A Roman case study

Why have people invaded and settled in Britain in the past?

ABOUT THE UNIT

In this unit, children are introduced to the idea that people from other societies have been coming to settle in Britain for a long time. They consider the effects of the invasion and settlement of the Romans on Britain. There is emphasis on historical enquiry using artefacts and Roman sites and interpretations of history.

WHERE THE UNIT FITS IN

This case study encourages the use of Roman sites and artefacts and will be a good choice for schools with easy access to a Roman settlement site.

Children build on their work in key stage 1, particularly using pictures and written sources to find out about the past. The visit to an archaeological site will provide a foundation for further consideration of what can be learned from archaeological remains,

The unit is expected to take 12 hours.

PRIOR LEARNING

It is helpful if the children have:

- learnt about the way of life of people living at a time beyond living memory
- asked and answered questions and made inferences from artefacts
- considered the different ways in which the past is represented, *eg pictures, buildings, stories, eye-witness accounts*
- listened to stories of past events

VOCABULARY

In this unit, children will have opportunities to use:

- words associated with the passing of time, *eg Roman, Anglo-Saxon, period, a long time ago*
- words associated with the Celtic way of life, *eg Celt, hill fort, tribe, transport, trade*
- words associated with the Roman way of life, *eg hypocaust, forum, basilica, mosaic, chariot, army, troops, legion*
- words associated with settlement, *eg invade, settle, emigration, immigration, refugee, conquest*

RESOURCES

- a large map of the world
- dictionaries
- flashcards about invasion and settlement
- a class time line
- pictures of Roman, Anglo-Saxon and Viking people
- packs of information about Celts and Romans who lived in Britain, including pictures of artefacts discovered at Roman sites in Britain
- two accounts of the story of Boudicca, including pictures

LEARNING OBJECTIVES

- to relate their own experience to the concept of settlement
- to recognise that people have been moving between different areas for a long time, and that some reasons for moving were the same as those of people alive today

POSSIBLE TEACHING ACTIVITIES

Why do people move away from where they were born?

Discuss the children's and their families' experiences of moving home to live either in a different part of the country or in a different country. Use a map to establish where they moved to and from. Encourage the children to suggest why they or their families moved, and list the reasons given. Help them to sort the reasons into those where families chose to move and where they had to move.

Take opportunities to use and explain words like *settlement, emigration, immigration, refugee*, and how these are different from words like *invasion, conquest*.

EVALUATION

- give reasons why families leave the place where they were born
- recognise that some people choose to leave and that others have to leave the place where they were born

LEARNING COMPETENCES

This discussion needs to be handled with sensitivity and care, especially if there are any refugee children in the class. It is important to draw out that some reasons for moving today are similar to why people moved in the past, *eg for work, to make a new life, because of fear*.

Recognising that communities are made up of people from different places, backgrounds and cultures can lead into a discussion of the workings of local and national communities, as a link to citizenship education.

If there are few children in the class whose families have moved from another country it will be necessary to refer to groups of immigrants that the children know about.

LEARNING OBJECTIVES

- to use the terms 'invade' and 'settle'
- to place the Celtic and Roman periods in a chronological framework
- to recognise characteristics that place Celts and Romans as having lived a long time ago in the past
- that Romans invaded Britain and that the period of conquest was followed by a period of settlement

POSSIBLE TEACHING ACTIVITIES

Who invaded and settled in Britain a long time ago?

Ask the children to find the dictionary definitions of the words 'invade' and 'settle'. Ask them to write their definitions in a two-column grid. Lead a discussion to develop the children's understanding of these terms.

Give the children cards with words and phrases that could be connected to either invasion or settlement, *eg stay, arrive, conquer, land, visit, remain*. Ask the children to place the cards in the correct columns on their grids. Ask them to feed back where they placed each word and why.

Establish that groups of people have been visiting, invading and settling in Britain for a very long time. Ask the children to look at the class time line and pick out the people and events they have already learnt about, *eg the Great Fire, Florence Nightingale*. Discuss with the children whether these people or events happened a long time ago, and which occurred the longest time ago.

Give the children pictures of a Roman and Celtic person. Encourage them to suggest clues that indicate these people lived a long time ago. Help the children to place the pictures at the appropriate place on the time line.

Give the children pictures showing a variety of Roman and Celtic images, *eg in armour, in battle, town life, country life, home life*. Ask the children to sort them first into Roman and Celtic groupings, and then into invasion and settlement groupings.

Discuss with the children the relationship between invasion and settlement.

EVALUATION

- use a dictionary to find the meanings of 'invade' and 'settle'
- sort words or phrases correctly under the headings 'invade' and 'settle'
- locate on a time line historical events that they have already studied
- select distinctive characteristics of Celtic and Roman people
- sort pictures to show understanding of features of Celtic and Roman life
- discuss ideas associated with invasion and settlement

LEARNING COMPETENCES

The class time line will need to include Celtic, Roman and Anglo-Saxon periods.

This activity would provide a useful context for reinforcing dictionary skills. The class might consider the range of definitions in dictionaries and information books, as a prelude to children developing their own definitions of the terms.

The activity could be adapted by giving children a grid with the dictionary definitions already in place.

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	Learning competences
<ul style="list-style-type: none"> to select and record information about Celtic and Roman ways of life to make comparisons between these lifestyles about aspects of life in Celtic and Roman Britain, using a variety of resources 	<p>Who were the Celts and who were the Romans? Ask the children to locate the Roman period on the class time line. Tell them that they are going to find out about the Romans and also about the Celts, who lived in Britain before the Romans arrived. Give them information about and pictures of the Celts and/or the Romans. Ask the children to complete a three-column grid with the headings: 'How they did things', 'Celts', and 'Romans'. In the first column children can list aspects such as <i>dress, belief, language, towns, farms, art, technology</i>. They can use the other two columns to compare the two ways of life.</p> <p>Discuss the children's answers with them, drawing their attention to similarities and differences.</p>	<ul style="list-style-type: none"> select relevant information from a number of sources complete a grid with relevant information using correct terminology for Celtic and Roman ways of life suggest similarities and differences between the lifestyles of Celts and Romans 	<p>It is important that the Celts are not presented as a set of primitive tribes. They were sophisticated, but different from the Romans. The issue could be highlighted by comparing the impression created by Julius Caesar's comments about the Celts from his story of his visits in 55 and 54 BC with the impression given by examples of Celtic artwork.</p> <p>Children could develop this activity further by investigating the lifestyle of Celtic tribes, <i>eg language, beliefs, dress, art, settlements such as hill forts, towns, farms</i> and/or considering the Roman way of life, <i>eg the importance of Latin, gods, dress, the organisation of the army, houses and their interior design</i>.</p> <p>Children could be divided into groups for this activity, with some groups looking at Celts and others the Romans.</p> <p>This activity could be adapted by asking children either to make labelled drawings or write their answers in sentences, as appropriate.</p>
<ul style="list-style-type: none"> that sources about Boudicca contradict each other that there are different opinions about Boudicca 	<p>Who was Boudicca? Show the children images of Boudicca. Ask them to describe what they see, drawing their attention to the differences in how she is portrayed. Discuss with the children what kind of person they think she was and why they think this. Ask the children to record their findings. Help them to find evidence that confirms or contradicts their ideas.</p> <p>Read two different descriptions of Boudicca. Ask the children to identify similarities and differences between the stories.</p> <p>Ask the children to draw a picture of Boudicca and write a short description of what they think she was really like.</p>	<ul style="list-style-type: none"> select information from pictures, which supports or contradicts other information identify similarities and differences between two written descriptions of Boudicca produce a description of Boudicca that draws on more than one source of information 	<p>Possible sources of information on Boudicca are: text books, postcards, contemporaneous writers, <i>eg Tacitus, Dio Cassius</i>, pictures of modern interpretations, <i>eg statues outside the Houses of Parliament or in Cardiff city hall</i>, pictures on book covers.</p> <p>Children could record their findings in a two-column grid with the headings: 'What we know', and 'Source of information', with prompts such as <i>hair, height, character, temper, colouring</i>.</p> <p>This activity could be adapted by asking the children to make a labelled drawing of Boudicca instead of a written description.</p>

LEARNING OBJECTIVES

- the main events in Boudicca's revolt
- the reason for the revolt
- that there are different interpretations of the revolt

- about the results of Boudicca's revolt
- to appreciate that people have points of view about events in the past

POSSIBLE TEACHING ACTIVITIES

What happened in AD 60?

Tell, read, or ask the children to read, the story of Boudicca's revolt. Ask them to retell the story in storyboards. Ask the children to read a different version of the story, *eg a play*, and look for similarities and differences between the two stories.

Ask children to compare the two interpretations of the story by answering targeted questions.

Discuss with the children the causes of the revolt and, with their help, arrange the causes in order of importance.

What were the short-term and long-term results of Boudicca's revolt?

Discuss with the children the immediate consequences of the revolt for the Celts and the Romans and record these on a big piece of paper. Also discuss the longer-term impact of the revolt on Britain.

Ask the children to think about how a Celtic or Roman survivor of the revolt might feel. Provide them with a suitable sentence-starter and ask them to write about the results of the revolt from the point of view of either a Celt or a Roman.

Discuss with the children why people might view the revolt differently.

EVALUATION

- sequence the main events of the revolt on a storyboard
- consider questions to identify similarities and differences between two versions of the event
- suggest one or more reasons for the revolt

- suggest consequences of Boudicca's revolt
- select information to show how a Roman or a Celt would have perceived the revolt

LEARNING COMPETENCES

This activity could be extended by asking children to consider why, when the Romans were so successful against Boudicca, they were less successful against other Celtic leaders and eventually needed to build Hadrian's Wall to separate Romanised and unconquered tribes.

Examples of a completed worksheet for this type of activity can be found in *Expectations in history* (SCAA, 1997, page 13).

Comparison of different texts about Boudicca would allow the class to reinforce and extend their understanding of the differences between fiction and non-fiction text, *eg to distinguish between fact and opinion*. Books with a particularly strong point of view would provide a useful context to explore how an argument is constructed and presented.

It is important to emphasise that the population of Britain did not become Romans, but that the Celts adopted Roman lifestyles. Many Celts living far away from the towns retained their old lifestyles throughout the Roman period.

LEARNING OBJECTIVES

- about evidence that tells us about life in Roman Britain
- ask and answer questions about what survived from the Roman settlement of Britain

POSSIBLE TEACHING ACTIVITIES

How did the Romans change Britain when they settled here?

Arrange a visit to a Roman site. Before the visit, tell the children that many Romans settled in Britain and introduced some of their customs and ways of life, *eg towns, baths, new forms of religion and farming methods*. Tell them that the Celts responded by building villas and adapting Roman styles of pottery and dress.

Ask the children to suggest what they would like to find out about on their visit. Develop a list of questions for them to use at the site. Take the children to the site and look for evidence of Roman lifestyles. Help the children to answer the prepared questions. After the visit, ask the children to create a classroom display, or produce a child's guide to the site they visited.

EVALUATION

- select information about life in Roman Britain from a range of sources
- present information to show understanding of the impact of Roman settlement on Britain

LEARNING COMPETENCES

It may be helpful to discuss with the children what happens to buildings when they are not used – that they might be demolished, or become decayed and eventually buried. Encourage them to think about which materials survive over long periods and which decay, and to suggest why more Roman buildings survive than Celtic ones.

These activities could be developed into a local study if there are Roman remains close to the school. Where a site visit is not possible, children could be asked to work from a variety of picture sources, texts and publications, for example those produced about a major Roman site.

To help with this part of the activity children could be given pictures of Roman artefacts from the site they will visit. Ask them to annotate the pictures, using different colours to show what they know, can guess at, or would like to know about each object.

Unit 3 The Solar System

ABOUT THE UNIT

In this unit children learn about the shapes and relative sizes of the Earth, Sun and Moon. Using models they learn how the three bodies move relative to each other and how these movements relate to night and day.

Experimental and investigative work in this unit focuses on:

- making observations and recognising patterns in first hand and secondary data
- representing data in graphs.

Work in this unit offers opportunities for children to relate scientific knowledge and understanding to familiar phenomena *eg day length, year length* and to consider scientific evidence about the Earth, Sun and Moon.

A visit to a planetarium or of a 'starlab' can enhance the teaching of this topic.

This unit takes approximately 11 hours.

WHERE THE UNIT FITS IN

Builds on Unit 1D 'Light and dark' and Unit 3F 'Light and shadows'

Children need:

- to know that the apparent position of the Sun changes over the course of a day
- to know that shadows change in length and direction over the course of a day
- to know that shadows are formed when light is blocked
- to know the compass directions north, south, east and west
- to be able to present data in tables and bar charts.

Links with Unit 6F and geography.

VOCABULARY

In this unit children will have opportunities to use:

- words and phrases related to the shape and movement of the Earth and Moon *eg sphere, revolve, orbit, spin, rotate, axis, sunrise, sunset, north, south, east, west*
- nouns and associated adjectives *eg sphere/spherical*
- words and phrases which have similar but distinct meanings *eg rotate around, rotate on its axis, spin, orbit*
- expressions for generalising and summarising
- descriptions and explanations involving a sequence of ideas.

RESOURCES

- video or other secondary sources *eg photographs* of Earth taken from space
- photographs of Sun, Moon and Earth
- globe with small object attached
- secondary sources providing information about earlier ideas of the shape of the Earth
- selection of spheres of different sizes including a beach ball, pea and beads about 1/4 size of a pea
- compass
- shadow stick
- torch with powerful beam
- secondary data about times of sunrise and sunset
- secondary sources providing information about how the appearance of the Moon changes over a 28-day period

LEARNING OBJECTIVES

- that the Sun, Earth and Moon are approximately spherical
- that it is sometimes difficult to collect evidence to test scientific ideas and that evidence may be indirect
- about the relative sizes of the Sun, Moon and Earth

POSSIBLE TEACHING ACTIVITIES

- Find out what children know about the Earth, Sun and Moon by asking them to draw and explain a picture showing how these would look to a traveller in space. Ask children questions about their drawings *eg*
- *Is the Earth flat?*
 - *Is the Sun bigger than the Moon?*
 - *Does the Sun move?*
- Following discussion, use secondary sources and models *eg video, CD-ROM, globe, photographs of the Earth, Sun and Moon taken from space* and ask children whether these suggest the bodies are flat or spherical. Point out to children that it is only in the last 40 years that we have photographic evidence from space about the Earth being spherical and ask them to find out some earlier ideas about whether the Earth was flat or spherical and what evidence people used to support their ideas.
 - Remind children of the pictures they drew earlier and the photographs they saw and ask them to put Earth, Moon and Sun in order of size by selecting from a range of spheres *eg football, beachball, tennis ball, pea, ball bearing, peppercorn, tiny beads about 1/4 size of pea, table tennis ball*. Explain to children that if a pea represents the Earth then the beach ball represents the Sun and the bead the Moon. Ask three children to hold the three spheres and position them in the classroom to give an idea of their relative distances apart.

EVALUATION

- recognise that the Earth, Sun and Moon are spheres
- describe some indirect evidence that the Earth is spherical *eg ships sailing round the world, ships appearing and disappearing over the horizon*
- select three spheres to represent the Earth, Sun and Moon recognising which is largest and which is smallest and making a reasonable match to relative size

LEARNING COMPETENCES

Teachers will need to take account of what this introductory work shows about children's knowledge and understanding of the Earth, Sun and Moon in their short-term planning.

This unit may be best taught in the winter months when children can look at the direction of the shadows soon after the Sun has risen and just before it sets.

In discussing the relative sizes of the Sun and Moon, it may be helpful to point out that an aeroplane on the ground nearby looks much bigger than an aeroplane in the sky and how this helps to account for the apparent similarity in size of the Sun and the Moon.

LEARNING OBJECTIVES

- that the Sun appears to move across the sky over the course of a day
- that evidence may be interpreted in more than one way
- that it is the Earth that moves, not the Sun, and the Earth spins on its axis once every 24 hours
- that it is daytime in the part of the Earth facing the Sun and night-time in the part of the Earth away from the Sun
- that the Sun rises in the general direction of the East and sets in the general direction of the West
- to make observations of where the Sun rises and sets and to recognise the patterns in these
- to present times of sunrise and sunset in a graph and to recognise trends and patterns in the data

POSSIBLE TEACHING ACTIVITIES

- Ask children about where the Sun shines into the school (or their homes) at different times of day. Remind them of earlier work on shadows and ask them to suggest what this evidence shows. If necessary observe the length and position of the shadow of a stick set up in the playground at different times of day over successive days.
- Use secondary sources *eg video, CD-ROM* to illustrate the Earth spinning on its axis. Show children a model of the process *eg using a globe and a strong light source to represent the Sun*. Ask children to show others *eg by modelling or using themselves as Sun and Earth or by drawing or using other models* how night and day arise from the Earth spinning on its axis. Talk with children about the different representations.
- Ask children to use a compass to observe and record, on several days in the winter, the direction of the Sun or of shadows from the Sun when it has just risen and just before it sets. Provide children with secondary data about times of sunrise and sunset and help them to present this data as a graph and to identify patterns in the data. Discuss with children whether it is dark or light when they get up in the winter and summer and what sorts of activities they can do on winter and summer evenings.

EVALUATION

- describe how the apparent position of the Sun changes over the course of a day and clarify that this does not mean that the Sun is moving
- illustrate *eg using models or drawings* that different parts of the Earth face the Sun during the course of the day and where it is day and night
- explain that the apparent movement of the Sun is a result of the Earth rotating or spinning
- generalise that the Sun rises in the East and sets in the West
- draw simple graphs and identify patterns *eg sunrise gets earlier and earlier up to June and then it starts getting later; when sunrise gets earlier, sunset gets later so it is daylight longer*

LEARNING COMPETENCES

SAFETY – warn children NEVER to look directly at the Sun. Blindness can result. See ‘Be Safe’ section 13.

It is helpful to point out to children that when they are travelling by car or train, houses seem to move. Some children may have had the experience of thinking they were moving when a train travelling in the opposite direction started to move but they stayed stationary.

It is possible to fix a small object to the globe and demonstrate how the shadow changes as the globe rotates and the light source remains still.

Times of sunrise and sunset throughout the year can be found in diaries, newspapers and HMSO publications. It may be helpful to simplify this data before presenting it to children.

LEARNING OBJECTIVES

- that the Earth takes a year to make one complete orbit of the Sun, spinning as it goes
- that it is not always easy to gain information about phenomena *eg the length of a year* using first-hand experience
- that the Moon takes approximately 28 days to orbit the Earth
- that the different appearance of the Moon over 28 days provides evidence for a 28-day cycle

POSSIBLE TEACHING ACTIVITIES

- Ask children to use secondary sources *eg CD-ROM, reference books* to find out what a 'year' is. Discuss with children their understanding of a 'year' *eg from birthday to birthday, through all the seasons*. Model the Earth's orbit of the Sun *eg a child moving round a central 'Sun' ie either a lamp or a large group of children, rotating at the same time*.
- Use secondary sources *eg video, CD-ROM, reference books* to illustrate that the appearance of the Moon changes in a regular manner over a period of approximately 28 days. Model the Moon's orbit round the Earth *eg by asking a child to walk round a group of children representing the Earth so that the child representing the Moon always faces the Earth*. Ask children to describe the movement of the Moon *eg as it goes round the Earth it turns so that the same side always faces the Earth*.

Review work done on the Earth, Moon and Sun by asking children to devise questions for a quiz (together with the answers). Ask children to pose questions to each other and help them to judge the appropriateness of the answers.

EVALUATION

- state that a year is the time taken for the Earth to make one complete orbit of the Sun showing that they know this from secondary sources *eg reference books, CD-ROMs, information provided by the teacher*
- explain that the pattern and time-scale of the changes in the Moon's appearance over 28 days is evidence that the Moon orbits the Earth once every 28 days

LEARNING COMPETENCES

The relationship of the seasons to the tilt of the Earth is not a requirement of the programme of study for Key Stage 2. Teachers will need to decide whether it is appropriate to discuss this with some children.

Children do not always understand that the Moon revolves on its axis as it orbits the Earth so that the same side of the Moon always faces the Earth.

Children should be encouraged to look at the Moon both at night and during the day. At this stage they are not expected to recall or explain the appearance of the Moon at different stages of its cycle.

At this stage it is not necessary to discuss different ways of measuring the length of the Moon's cycle. Some children, however, may be aware of some of these differences.

Unit 4 Earth and the Elements

ABOUT THE UNIT

In this unit children learn about the differences between solids and liquids and recognise that the same material can exist as both solid and liquid. They identify changes that occur when solids and liquids are mixed and how to separate undissolved solids from a liquid. They learn that melting and dissolving are different and recognise that when a solid dissolves it is still there.

Experimental and investigative work focuses on:

- deciding what apparatus to use
- making and recording observations and measurements
- drawing conclusions.

Work in this unit also offers opportunities for children to explain everyday observations about processes such as dissolving and filtering using scientific ideas.

This unit takes approximately 11 hours.

WHERE THE UNIT FITS IN

Builds on Unit 2D 'Grouping and changing materials', Unit 3C

'Characteristics of materials' and Unit 3D 'Rocks and soils'

Children need:

- to know vocabulary used to describe materials
- to be familiar with melting and freezing
- to know how to separate solids by sieving.

Links with 4C, 5C and 5D.

VOCABULARY

In this unit children will have opportunities to use:

- terms relating to states of matter and to separation *eg solid, liquid, melt, freeze, solidify, dissolve, solution, filter, undissolved, dissolved*
- expressions for making suggestions using 'if', 'might', 'could'
- descriptions using a sequence of ideas.

RESOURCES

- a range of measuring jugs, cups or cylinders
- collection of solids, liquids and powders in transparent containers
- magnets
- water wheel or sand wheel
- sieves, funnels, filters, coffee bags and tea bags
- marbles
- solids which behave differently with water *eg salt, instant coffee, sugar, flour, plaster of Paris, sand, glass, beads, ball bearings, chalk*
- set of cards illustrating everyday processes to match with cards naming scientific processes

LEARNING OBJECTIVES

- to identify solids and liquids
- that there are liquids other than water

POSSIBLE TEACHING ACTIVITIES

Elicit children's existing knowledge of materials by presenting them with a collection of solids and asking them to group these according to their own criteria, recording reasons for their choices. Revise language for describing properties.

- Present children with additional items for the collection including liquids of differing viscosity and ask them to divide them into two groups only. If necessary supplement the examples with pictures. Discuss the groupings with the children introducing the terms 'solid' and 'liquid' and ask children to re-group the items in this way. Ask children to write down or draw in as many ways as possible how the solids and liquids are different from each other and how they are similar. It may be helpful to ask questions eg
 - *Are all the liquids colourless?*
 - *What happens to the liquid if you change the container it is in?*
 - *Can you spill the solids?*
 - *What happens if you tilt the bottle the liquids are in?*Draw children's attention to particular properties. Extend the activity by presenting children with some 'difficult' items eg *cotton wool, sponge, sand, rice* and ask them to classify these as solids or liquids.

EVALUATION

- correctly classify materials as liquid or solid eg *wood, iron, syrup, shampoo, cooking oil*, explaining the reasons for their choices
- describe similarities between solids eg *they don't change shape when you move them* and between liquids eg *they move when you tilt the bottle* and differences between solids and liquids eg *you can pour the liquids but not the solids*
- classify items eg *rice, sponge* as solids

LEARNING COMPETENCES

Teachers will need to take account of what this introductory work shows about children's knowledge and understanding of materials in their short-term planning for this unit.

Children would not be expected to know the term viscosity, 'runniness' is an adequate description.

Materials such as sponge can be classified as solids at this stage although they change shape easily because of the air within them.

LEARNING OBJECTIVES

- to make careful observations and measurements of volume recording them in tables and using them to draw conclusions
- that liquids do not change in volume when they are poured into a different container
- that solids consisting of very small pieces behave like liquids in some ways

- that the same material can exist as both solid and liquid
- that liquids can be changed to a solid by cooling and this is freezing or solidifying
- that a solid can be changed to a liquid by heating and this is melting

POSSIBLE TEACHING ACTIVITIES

- Revise with children how volumes of liquids are measured. Ask children to find out and record in a table what happens to shape and volume when liquids are poured from one container into a different shaped container. Talk with children about what their results show and ask them to use them to make a generalisation.

- Ask children to explore and describe how powders and solids consisting of many small pieces *eg rice, salt, sand* are different or similar to liquids *eg by tilting jars containing these, by trying to use sand to turn a water wheel, by sieving through gauze.*

- Ask children to suggest when they have seen water freezing, and what conditions are necessary for this to happen. Ask them to suggest how to make ice melt. Elicit examples of other familiar materials melting or solidifying *eg wax running down the side of a candle, chocolate melting etc.* and let children explore what happens to wax if it is held in the hand or put in a warm place. Ask children how to keep familiar materials *eg ice, chocolate, butter* from melting and help them to relate these to temperature.

EVALUATION

- measure accurately volumes of liquids and record these and observations of shape in a table
- use their results to conclude that although liquids change shape when they are poured into a different container they do not change volume

- describe similarities between powders and liquids *eg they both can be sieved through gauze, you can use a stream of salt or sand to turn a wheel like a water wheel*
- explain that the powders flow like liquids because they have very fine particles
- explain how to turn water to ice and ice to water
- describe that ice melts when it is left in a room but that some other things have to be warmed to make them melt

LEARNING COMPETENCES

At this stage the word 'particle' is used for 'very small pieces'.

Many everyday examples of melting or freezing *eg chocolate melting* are complicated by the other changes that also take place. Consequently melted chocolate does not return to its original state when it is cooled.

LEARNING OBJECTIVES

- that different solids melt at different temperatures
- that melting and solidifying or freezing are changes that can be reversed and are the reverse of each other
- that solids can be mixed and that it is often possible to get the original materials back
- to choose appropriate apparatus for separating a mixture of solids
- that changes occur when some solids are added to water
- to make careful observations, recording results in tables and make comparisons

POSSIBLE TEACHING ACTIVITIES

- Use secondary sources *eg video, CD-ROM pictures* to illustrate molten metals or molten lava and emphasise that many materials have to be heated before they melt. Ask children to use secondary sources to find out more about melting metals and to record information about why this is important.
- Demonstrate to children how solid particles of different size can be separated by sieving to remind them of earlier work on soils. Challenge children to separate a mixture of *eg sand, rice, dried peas and paper clips using their own techniques and to explain why these worked.*
- Ask children to explore what happens when a range of materials *eg salt, instant coffee, sugar, flour, powder paint, chalk, sand, glass beads or marbles, plaster of Paris*, are mixed with water and to group the solids according to what happens, recording their results in a table.

EVALUATION

- describe what has to be done to turn a metal or lava into a liquid and to turn it back to a solid and suggest reasons for melting metals
- separate the mixture
- explain that mixtures can often be separated because the large grains won't go through the holes but the small ones will
- describe different types of behaviour when solids are mixed with water *eg sand and glass beads settle on the bottom, you can't see salt and sugar any more, the plaster of Paris makes a hard solid with the water*

LEARNING COMPETENCES

Children often confuse melting and dissolving. It is helpful to establish the idea of melting and its connection with an increase in temperature before dissolving is introduced.

First-hand observation of a molten metal could be introduced by demonstrating a soldering iron.

SAFETY – Children should not touch the apparatus and should stand back when it is demonstrated.

Children often describe dissolving by saying the solid disappears. It is important to discuss this with them and to clarify their meaning. Subsequent work should help them to understand that although the dissolved solids cannot be seen they are still present in the solution.

SAFETY – Care should be taken that children do not inhale plaster of Paris dust.

LEARNING OBJECTIVES

- that when solids do not dissolve or react with the water they can be separated by filtering
- to choose apparatus to separate an undissolved solid from a liquid
- that some solids dissolve in water to form solutions and that although the solid cannot be seen it is still present
- to predict whether salt or sugar can be separated from a solution by filtering and to test the prediction to see if it was correct
- to decide what apparatus to use
- when it is safe to taste things to test them

POSSIBLE TEACHING ACTIVITIES

- Ask children to suggest and try out how they could get marbles or sand back from the mixture with water. Discuss with the children why marbles can be separated from water by coarse sieves but sand cannot.
- Remind children that when salt and sugar are added to water clear solutions are obtained, and if necessary show them this again. Ask children to say what they think has happened to the salt and sugar, remind them *eg of adding sugar to tea or salt to cooking vegetables* and to suggest how they could find out *eg by tasting the solution*. Ask children to predict whether the salt or sugar could be separated by filtering. Discuss what they would need to do to find out whether their prediction is correct and help them to decide how to do this. Find out by testing whether their prediction is correct or not.
- Review work on solids, liquids and separating solids and liquids by presenting children with a series of cards showing everyday processes *eg using a tea bag, adding salt to cooking, warming fat in a pan for cooking vegetables, putting ice cubes in a drink, warming a frosted windscreen, getting lumps out of flour and cards naming processes eg filtering, dissolving, melting, sieving and ask children to match the cards. Talk with children about how they knew how to match the cards.*

EVALUATION

- explain that the sieves will separate marbles from water but not sand *eg the marbles are too big to go through the holes but the sand is small enough*
- explain that filters are like sieves with very small holes which the small pieces of sand and chalk cannot go through
- suggest how to test these predictions *eg mix the salt and water and then pour it through a filter*, if the liquid that comes through tastes salty we didn't separate the salt
- explain that sugar or salt can't be seen but are still present *eg I can't see the sugar but it still tastes sweet so it must have gone into the water*
- explain why filtering cannot separate dissolved sugars or salt from a solution *eg saying the holes in the filter are big enough for the salt to go through*
- explain why it was safe to taste the solution *eg we used clean water and clean beakers and we knew we'd only put salt in*

LEARNING COMPETENCES

It is important to clarify that children recognise the difference between melting and dissolving.

SAFETY – Scrupulous hygiene must be observed for all tasting activities. Ensure all utensils and surfaces are clean.

Get children to wash their hands before the activity. Take care sugar and salt do not become contaminated. Buy fresh samples for this activity.



LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	LEARNING COMPETENCES
Where does water come from?			
<ul style="list-style-type: none"> about the water cycle, including condensation and evaporation 	<ul style="list-style-type: none"> Use pictures, charts and video to reinforce any previous work on water, and identify and discuss with the children the components of the water cycle. 	<ul style="list-style-type: none"> identify and sequence the components of the water cycle 	<p>Science: this work can be linked to work on the water cycle (Unit 5D).</p>
Where does water go to?			
<ul style="list-style-type: none"> about how site conditions can influence the weather 	<ul style="list-style-type: none"> Visit the playground or school field and ask children to note run-off – water collection areas – after rainfall. Other activities that children could carry out include: identifying areas of poor drainage; measuring how puddles change over time; photographing and tracing changes; and carrying out controlled experiments in the classroom. 	<ul style="list-style-type: none"> draw puddle maps to scale describe what happens to rain water when it reaches the ground identify forms in which water occurs in the environment 	<p>To answer the enquiry question, focus activities on specific questions, <i>eg Are there areas of water after rain? Are they large or small? Are they due to poor drainage? Do they drain to one point?</i></p> <p>Mathematics: when noting run-off, children will measure and use area and scale.</p>
<p>The unit is expected to take 12 hours</p>			

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	COMPETENCES
<p>Where is The Thames? Where does it go? How is it changing? What do I think and feel about the river? <i>What is this river like? How does it affect the landscape? How is it changing and why?</i></p>			
<ul style="list-style-type: none"> • to make plans and maps • how rivers erode, transport and deposit materials producing particular landscape features • to use secondary sources of evidence • to use ICT to handle data • to investigate places • to analyse and communicate • to use geographical vocabulary • to use atlases and globes • to use secondary sources • to use ICT to access and present information • about links with other places • about river systems • about environmental impact 	<ul style="list-style-type: none"> • Ask the children to use local maps to locate the river and its area of flow and draw a map of the route from school to the river. • Visit the river and ask the children to sketch it and its banks and to photograph features. • Describe and explain erosion and deposition, focusing on a suitable meander point to contrast outer and inner bends, speed of water flow, contrasts in river bank features and water depth. • Help the children select a river to study. Ask them to locate the chosen river, using globes, atlases and maps and to research it, using books, photopacks, newspaper and magazine articles. Ask the children to find out further information about the river by using CD-ROM or the internet. • Ask the children to use ICT to produce a project folder on their river. This might include: <ul style="list-style-type: none"> – connections between farming, industry and climate – annotated maps that identify, <i>eg settlements along the river, national boundaries, tributaries, transport routes, roads, railway lines</i> – causes and effects of changes in the river, <i>eg floods, drought, pollution</i> – descriptive accounts of a journey along the river 	<ul style="list-style-type: none"> • draw a map of the route of a river • draw sketch maps of a river and label the main features • identify parts of the river system • record and graph changes to features of the river • show change along a river's length through a sequenced display of sections, graphs and sketches • map a river section and annotate land use • express personal likes and dislikes about the river 	<p>To answer the enquiry questions, focus activities on specific questions, <i>eg Does the river change appearance along its length, or over time? How fast is it flowing? What processes are acting here? What is the river used for?</i></p> <p>History: if children look at how the river and its surrounding area have changed over time and use archive material and census documents, the work could be linked to local history.</p> <p>IT: entering and using stored data in a data file.</p> <p>To answer the main enquiry question, focus activities on specific questions, <i>eg What do I already know about this river? What do I think it will be like? Where is it? How does it link with other places? What is the pattern of this river? How does it change? What would it feel like to be there?</i></p> <p>Literacy: when finding out about the river, children can identify the language used in different accounts of rivers in literature and information books, <i>eg impersonal language in encyclopedia entries</i>. Teach effective report writing, <i>eg how to orientate a reader in an introductory paragraph by underlining key points and using precise detail</i>.</p>

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	COMPETENCES
<ul style="list-style-type: none"> • to use appropriate geographical vocabulary • to use maps • the location of places and environments <p>Nationally designated areas: There is a government agency in each country with the power to designate national protected areas. They are:</p> <p><u>Countryside Council for Wales</u> <u>Natural England</u> <u>Scottish Natural Heritage</u></p> <p>There are three types of nationally protected areas in the UK - Areas of Outstanding Natural Beauty - in England, Northern Ireland and Wales</p> <p>National Scenic Areas - in Scotland</p> <p>There are 15 members in the UK National Park family:</p> <p>10 in England - The Broads, Dartmoor, Exmoor, the Lake District, the New Forest, Northumberland, the North York Moors, the Peak District, the South Downs and the Yorkshire Dales.</p> <p>2 in Scotland - Cairngorms and Loch Lomond and the Trossachs.</p> <p>3 in Wales – the Brecon Beacons, Pembrokeshire Coast and Snowdonia.</p>	<ul style="list-style-type: none"> • IUCN definition of a protected area: <p>“A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated Ecosystem services and cultural values”.</p> <p>In other words: A protected area is a location which has a clear boundary. It has people and laws that make sure that nature and wildlife are protected and that people can continue to benefit from nature without destroying it.</p> <p>Volunteers</p> <p>Some National Parks have hundreds of volunteers. People like to volunteer for National Parks because they get to be outside in beautiful countryside, mix with other people, keep fit and know that they are helping to look after National Park landscapes. Our volunteers do lots of different jobs, like leading guided walks, fixing fences, dry stone walling, checking historic sites and surveying wildlife.</p> <p>Volunteers don't get paid, but National Park Authorities could not achieve what they need to do without the National Park Authorities work with these and many other organisations to look after the landscape, wildlife and cultural heritage within National Parks.</p>	<p>What is a National Park, where are they, who owns them? The aims and purposes of National Parks Protected areas in the UK and around the world How National Parks got created in our history story The biggest, most visited, oldest, all the facts and figures Maps of all the National Parks</p> <p>Who looks after national parks?</p> <p>National Parks are large areas of land, including towns and villages, which means that lots of people and organisations help to look after them.</p> <p>National Park Authorities</p> <p>Each National Park is looked after by an organisation called a National Park Authority, which includes Members, staff and volunteers.</p>	

Unit 6: Investigating landscapes in the UK: Coasts.

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	LEARNING COMPETENCES
<p>What is a coast? Which coastal areas have we visited? How do waves shape coastal environments? How does human activity affect coastal environments? The unit is expected to take 12 hours.</p>			
<ul style="list-style-type: none"> • to use appropriate geographical vocabulary • to use maps • the location of places and environments • about the physical features of coasts and the processes of erosion and deposition that affect them • to collect and record evidence • to communicate in ways appropriate to the task and audience • to use appropriate geographical vocabulary • to use maps and atlases • to use secondary sources of information • to use ICT • about the physical features of coasts and the processes of erosion that affect them 	<ul style="list-style-type: none"> • Ask the children to say what they think a 'coast' is, ie a zone where land and sea meet. • Using a map of the UK, ask the children to find any coastal areas that they have visited. • Introduce the idea that coastal environments are very varied and in a constant state of change: that some parts of the coast are being worn away (erosion landforms) and that some parts are being built up (depositional landforms). • Introduce the idea that waves can erode rock and cliffs; discuss the significance of rock type – hard rock tending to form headlands and soft rock tending to be eroded to form openings in the coastline (bays). • Ask the children to use a map of the UK in an atlas to identify these features. • Ask the children to study photographs of headland features and identify caves, arches and stacks. Ask the children to complete diagrams of these features and to explain what they think has happened in terms of erosion. • Introduce the idea that human activity can also cause erosion of the coastline. Discuss with the children how building on a cliff can increase the likelihood of cliff instability and slope failure (eg <i>Holbeck Hotel in Scarborough which collapsed into the sea in June 1993</i>). 	<ul style="list-style-type: none"> • identify coastal areas using a map • identify coastal features using maps, atlases and photographs • have some understanding of headland features and stages of erosion • understand the impact humans may have on coastal environments 	<p>If children have studied rivers, links could be made here – processes of erosion and deposition, and rivers as part of the coastal environment.</p> <p>Literacy: writing a newspaper report allows children to use different forms of writing.</p> <p>ICT: producing a newspaper report provides children with opportunities to use word processing and desktop publishing.</p>

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	LEARNING COMPETENCES
<p>What are the main land uses on this section of the coastline? Why? What are the main features of this section of coast? What processes are affecting it? Why do we need to manage the coastline?</p>			
<ul style="list-style-type: none"> • to ask geographical questions • to collect and record evidence • to use appropriate geographical vocabulary • to use appropriate fieldwork techniques • to use maps • to draw plans • about the physical features of coasts and the processes of erosion and deposition that affect them • about the physical features of coasts and the processes of erosion and deposition that affect them • how people can improve or damage the environment • how decisions about places and environments affect the future quality of people's lives • how and why people may seek to manage environments sustainably 	<p><i>Coastal features and environments will vary depending on geographical location – some generic fieldwork strategies are outlined below:</i></p> <ul style="list-style-type: none"> • Using large-scale Ordnance Survey maps, ask children to identify the main features and land uses of the section of coastline to be visited. • Ask the children to produce field sketches (the teacher may produce a sketch outline as a starting point), noting salient features. • Ask the children to follow a trail (following a route on a map and using a compass) with listed coastal features to be identified and photographed and related questions to be answered. Children should be encouraged to list their own questions during fieldwork. • Discuss with the class different strategies for coastal management (<i>eg cliff-face armouring, groyne, artificial harbours, sea walls, doing nothing</i>) and the advantages and disadvantages of such strategies (<i>eg prevent rock falls and cliff retreat</i>). • Help the children to make links with incidents discussed earlier (<i>eg Holbeck Hotel in Scarborough/'lost villages'</i>). 	<ul style="list-style-type: none"> • identify land uses • produce a field sketch • follow a trail using a map and compass • ask and research their own questions • identify and explain different strategies for coastal management • understand how decisions about coastal management affect the future quality of people's lives 	<p>ICT: these activities provide opportunities to use a digital camera to photograph coastal features.</p>

Unit 7 Air and Water

ABOUT THE UNIT

Through this unit children learn that gases are material and can be distinguished from solids and liquids by their properties.

They also learn about the uses of some important gases and where gases are found.

Experimental and investigative work focuses on:

- making and repeating observations
- relating observations and conclusions to scientific knowledge and understanding.

Work in this unit also offers opportunities for children to use scientific knowledge and understanding to explain everyday phenomena related to air and other gases.

This unit takes approximately 10 hours.

WHERE THE UNIT FITS IN

Builds on Unit 3D 'Rocks and soils', Unit 4D 'Solids, liquids and how they can be separated' and Unit 4E 'Friction'

Children need:

- to know that volume is the amount of space that something takes up
- to recognise differences between solids and liquids.

VOCABULARY

In this unit children have opportunities to use:

- names of gases *eg air, carbon dioxide, helium, natural gas, oxygen*
- names of processes related to changes of state, and verbs related to them *eg evaporation/evaporate*
- descriptions and explanations involving a sequence of ideas.

RESOURCES

- digital balance or coat hanger
- balloons (reasonably large)
- sheets of card
- sponge
- jar of marbles/ball bearings
- soils
- measuring jugs/cylinders
- helium balloon
- can of fizzy drink
- picture of gas cooker
- strong perfume, air freshener
- syringes filled with air, water and sand
- sealed balloons/polythene bags containing air and water

LEARNING OBJECTIVES

- to recognise differences between solids and liquids
- that powders and sponges are solid materials with air in the 'gaps' in between particles
- to make careful observations of materials and to explain these using scientific knowledge and understanding
- that observations and measurements may need to be repeated

POSSIBLE TEACHING ACTIVITIES

- Present children with a collection of solids and liquids, or of pictures of solids and liquids, and ask them to group them and list the similarities in, and differences between, each group.
- Present children with several short activities *eg squeezing a sponge under water, pouring water onto ball bearings, beads or marbles in a jar, pouring water gently onto loosely packed sand or soil*. Ask children to speculate about what the bubbles are and where they came from. Encourage children to look closely at dry sponge or soil using a hand lens and discuss their ideas about what is in the 'spaces'.
- Ask children whether they are sure about the observations made in the previous activity. Talk with them about what they could do to check. Repeat the previous activities and compare the observations with those obtained previously.

EVALUATION

- identify characteristic properties of solids and liquids, *eg solids retain their own shape, liquids flow and take the shape of the container they are in*
- describe how bubbles appear *eg when I squeezed the sponge lots of bubbles came up, when I poured the water on the soil bubbles started to come up. They went on coming after I stopped pouring*
- identify the bubbles as coming from the spaces between the particles and with help suggest they are air
- explain why it is helpful to repeat observations *eg the first time I saw lots of bubbles which I didn't expect, when I did it again I saw lots of bubbles again. I think my observations were right or you might make a mistake, if you get the same results another time, they are probably right*

LEARNING COMPETENCES

Teachers will need to take account of what this introductory work shows about children's understanding of solids and liquids in their short-term planning for this unit.

At this stage children should be encouraged to think of particles simply as very small pieces of material.

SAFETY – Collect soil from areas free from broken glass and unlikely to be contaminated with dog faeces. Children should wash hands after handling soil.

This activity shows why it is helpful to repeat observations

LEARNING OBJECTIVES

- that soils have air trapped within them
 - to measure volumes of water carefully
 - to recognise whether measurements need to be repeated
 - to use their results to compare the air trapped in different soils
-
- that there are many gases and many of these are important to us

POSSIBLE TEACHING ACTIVITIES

Ask children to suggest why it is helpful for soil to have air in it. If necessary, remind them of what they know about animals living in the soil. Ask them to suggest how they could compare the amount of air in different soils *eg pouring water on the soils and measuring the volume*. Explore with children how they might do this and with them decide on a method *eg by pouring water on to equal quantities of different soils and measuring the volume which sinks into the soil by subtracting the volume left in the measuring jug or cylinder from that at the start*. During the exploration discuss whether they think the measurements are accurate and ask children what they could do to find out. Talk with children about their results and help them to interpret them.

Review what children have learnt about air and remind them that it is not a solid or liquid. Introduce (or re-introduce) the word gas. Ask children what other gases they have heard of. Stimulate ideas by showing children examples *eg a helium balloon, shaking a bottle of fizzy drink containing carbon dioxide, a picture of a gas cooker using natural gas*. Ask children to use secondary sources *eg, CD-ROM, reference books* to find out about a range of gases and how they are used *eg natural gas as a fuel to heat, helium in balloons, oxygen in hospitals, 'gas' as anaesthetics, carbon dioxide in fizzy drinks*. Ask children to present findings as an information leaflet or poster.

EVALUATION

- use measuring jugs or cylinders to make measurements of volume
 - repeat measurements to check results using the same quantity of dry soil
 - explain that bubbles appear because the water pushes the air (gas) out of the spaces between the particles of soil
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- name several gases and identify one way in which each is useful to us

LEARNING COMPETENCES

This activity offers children the opportunity of carrying out a whole investigation. It may be helpful to concentrate on the aspects of investigation highlighted in the learning objectives.

Children may be confused by the use of the word 'gas' (short for gasoline) for petrol, which is a liquid.

If possible it is helpful to show children what liquid air is like *eg using CD clip*.

LEARNING OBJECTIVES

- that gases are formed when liquids evaporate
- to explain 'disappearance' of water in a range of situations as evaporation

- that other liquids evaporate and form gases which flow easily from place to place
- to make observations and to explain phenomena in terms of scientific knowledge and understanding

POSSIBLE TEACHING ACTIVITIES

- Ask children what happens to puddles in the playground when it stops raining and to wet washing when it is put out to dry. Discuss their ideas with them. Illustrate evaporation *eg chalking round the edges of puddles at intervals as they evaporate or by showing children a container of water left in the classroom for several days on which the original water level was marked*. Talk with the children about where the water has gone and introduce the term 'evaporate'. Help children to make annotated drawings to describe and explain what happened.

- Put a small quantity of a strong perfume or air freshener on a saucer at the front of the class. Ask children to respond when they smell it and to try to explain what they observed using annotated drawings. Ask children to find out why natural gas has a 'smell' added to it before it is supplied to consumers.

EVALUATION

- identify the process which takes place when water changes to a gas as evaporation
- identify a range of contexts *eg water left in an open dish, washing, drying, puddles drying up*, in which water evaporates

- explain that we smell things when gases enter our noses *eg the perfume evaporated and made a gas which travelled to us and we smelt it*
- explain that we smell many liquids *eg paint* because gases from the liquid travel through the air to our noses when some of the liquid evaporates
- explain that natural gas can cause explosions, and if we can smell it we can detect leaks

LEARNING COMPETENCES

Children may encounter the terms 'gas' and 'vapour'. At this stage it is not necessary to make a distinction between them.

Children often use the term 'disappear' to describe evaporation. It is important that they understand that although *eg a puddle* has disappeared, the water remains in the air.

SAFETY – Petrol must never be used in the classroom.

- that gases are different from solids and liquids in terms of how they do not maintain their shape and volume
- that gases flow more easily than liquids and in all directions

- to identify and describe differences in properties of solids, liquids and gases

- Present children with some short activities *eg pouring a liquid from one container to another, transferring a solid from one container to another, attempting to squash syringes filled with air, water and sand, squashing tightly sealed balloons filled with water and air, removing the stopper from a bottle of perfume and from a bottle of water.* Ask children to write down as many differences as they can think of between solids, liquids and gases.

- Ask children to make summary cards to explain ways in which solids, liquids and gases differ.

- describe a number of differences *eg gases are more easily squashed than solids or liquids, gases escape from containers and flow everywhere, when liquids spill they just run along the floor*

- summarise differences identifying aspects such as ease of flow, and whether solids, liquids and gases retain their own shape and volume when moved to different containers

SAFETY – Coloured gases should **not** be shown to children as they are really too dangerous to be used in primary schools. Secondary sources might be used to illustrate that gases are not always colourless.

SAFETY – school guidelines on the use of any syringe must be observed. Use of syringes must be carefully supervised, count them out and count them back.