

OCR A Science – Particulate pollution – Hampstead Heath

Specification links

C1.1 What chemicals make up air, and which ones are pollutants? How do I make sense of data about air pollution?

Specification Objectives:

6. When using their own and given data relating to measured concentrations of atmospheric pollutants, or the composition of the atmosphere:

- uses data rather than opinion in justifying an explanation
- can suggest reasons why a measurement may be inaccurate
- can suggest reasons why several measurements of the same quantity may give different results
- when asked to evaluate data, makes reference to its reliability (i.e. is it repeatable?)
- can calculate the mean of a set of repeated measurements
- from a set of repeated measurements of a quantity, uses the mean as the best estimate of the true value
- can explain why repeating measurements leads to a better estimate of the quantity
- can make a sensible suggestion about the range within which the true value of a measured quantity probably lies
- can justify the claim that there is/is not a 'real difference' between two measurements of the same quantity
- can identify any outliers in a set of data, and give reasons for including or discarding them.

C1.2 What chemical reactions produce air pollutants? Where do these pollutants come from?

Specification Objectives:

13. understand that atmospheric pollutants cannot just disappear, they have to go somewhere:

- particulate carbon is deposited on surfaces, making them dirty
- sulphur dioxide and nitrogen dioxide react with water and oxygen to produce acid rain

KS4 NC How Science Works link:

2. Practical and Enquiry Skills

- a. Plan to test a scientific idea, answer a scientific question, or solve a scientific problem
- b. Collect data from primary or secondary sources
- c. Work accurately and safely, individually and with others, when collecting first hand data
- d. Evaluate methods of collection of data and consider their validity and reliability as evidence

3. Communication skills

- a. Recall, analyse, interpret, apply and question scientific information or ideas
- b. Use both qualitative and quantitative approaches
- c. Present information, develop an argument and draw conclusions using scientific, technical and mathematical language.

Key questions

In London what are the main pollutants and what are the key sources?
Where do the pollutants go?
What affects do pollutants have on the environment?
What is a bio monitor?
Why do we sample areas studied?

How learning will be assessed

Oral participation in small groups and whole class discussion.
Individual skill development of reading and highlighting relevant information
Identifying variables – independent and dependent.

Misconceptions

The larger the sample the more accurate the results.
Ozone is in decline throughout the atmosphere.

Websites and resources

SKEES Project – <http://www.kcl.ac.uk/depsta/education/skees.html>
Contact Rod Watson at King's College, London

For up-to-date statistics
<http://www.londonnoisemap.com/>

<http://www.londonair.org.uk/london/asp/home.asp>

<http://www.airquality.co.uk/archive/index.php>

For news articles

<http://www.research-tv.com/stories/health/airpollution/bb/>

<http://search.eurekalert.org/e3/query.html?col=ev3rel&ht=0&qp=&qq=&qc=ev3rel&pw=100%25&ws=0&la=&si=1&fs=&qt=air+pollution&ex=&rq=0&oq=&qm=0&ql=&st=1&nh=10&lk=1&rf=1>

Upd8 ASE website –
<http://www.upd8.org.uk/activity/160/Acid-rain-Britain-recovers.html>

Session 1: Pre-fieldwork activities in the classroom

Aim: To understand the key sources of pollution and the distribution of pollutants within an urban setting. To be able to collect and analysis data and evaluate a method which studies local pollution; and to compare primary with secondary data.

Time	Teacher Activity	Student Activity / Differentiation	Resources
Starter (10 min)	Picture of London projected on board; Q - Describe this picture. Record adjectives on board. Smoggy / dirty? Picture of cyclist. Q - Why do they wear a mask? <i>Thus it is this smog / haze / pollution that you are going to be thinking about.</i> Lesson title: Pollution – where does it come from, can we measure it and who is affected?	Describe picture to partner Recall to teacher	London smog 1-picture Cyclist 2 picture
Activity One (20 min) Presenting new information	Q: In London what are the main pollutants and what are the key sources? Give out Sheet 1. Summarise and ask for key pollutants and sources. Use pictures to help Q&A. A second sheet is available to consolidate knowledge (<i>this is on the formation of acid rain</i>), and this can be modelled on the IWB Q - Where do the pollutants go? Why do we hear about them so much in the news? > give out/ show on projector news headlines involving pollution cases. List on board where pollutants go and differing affects they have. Be sure to mention lichens as air pollution bio-indicators here.	Read information sheet. Answer questions. Read headline and short articles and highlight answers using to different colours of where pollutants go and what affect they have on life. (Lots of other K&U standing sheets can be used here from the SKEES project – these would take up to an hour).	Sheet 1: Directed reading Sheet 2: Formation of acid rain Power station. and car exhaust (picture 3 & 4) Sheet 3: Newspaper headlines – Word and projector.
Activity Two (20min) Constructing problem and a method	Speaking couple putting problem forward... (use projector) Draw on board a plan diagram of the neighbours' locations What do pupils think in pairs; whom do they most likely agree with and how could they gain evidence to support their opinion? Using line diagram. Prediction – The amount of pollution will decrease further from the road, into the middle of the park. Method – Transect of trees away from the road into the middle of the park. Sample collection of black particles at each site (why will we sample?) NB*	Discuss with partner opinions and how it could be tested. Pupils could write in books Sampling is representative measurement.	PowerPoint - Air pollution argument
Activity 3 (5 min) Sense of place	PowerPoint to give an overview of the site that the method will be tested in. This should give pupils a sense of place, also some historic background to where they will visit. Health and safety discussed at this point also.	Listen and watch PowerPoint. Note down any physical evidence or data that is stated in the talk.	Sense of Place PowerPoint. Background information for teachers
Plenary (5 min) Pupil review	Set homework. Ask: Why will we sample the site for pollution? What organism can be used to monitor air pollution? Name 3 pollutants and there sources.	Record homework. Think and answer questions.	

Homework – *Using the internet find relevant sites that list pollution data for the borough. Note down for last year when the highest and lowest SO_x, CO and NO_x days were. Find out which is the most and least polluted parts of England. Record all this in your exercise books.*

This allows for differentiation by outcome.

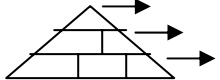
NB* - The writing of methods could be developed into an individual lesson. If time permits, the class could be brought outside to a local site before designing the method to be shown how to identify a tree. Then Sellotape could be used on the tree and the particles could be looked at immediately after under the microscope. Discuss with the pupils how this method could then be used to sample all the way along a 'transect'.

Session 2: Fieldwork**Aim:** To be able to collect evidence of air pollution in a consistent fashion.

Time	Teacher Activity	Student Activity / Differentiation	Resources
Starter (10 min)	Q - What is the prediction? How are we going to measure it? Note on boards Students to get into small groups. Each group to collect equipment and to distribute roles. Review health and safety points again.	Read methods Pupils explain Pupils to form groups – key roles recorder, distance measurer, sampler, noise pollution monitor	Clipboard, recording sheet, long tape measure, selotape, slides, noise datalogger, tree id sheet, lichen key
Activity One Demo (20 min)	Model taking a sample on the bark using Sellotape. Use the data logger to measure sound and show what a transect is and how to measuring distances. Also discuss tree id and tree measurement (this might be too much for the groups to do?) Q; How are all these readings going to be kept consistent? Split the class groups into 3 smaller groups. Start one group at bottom of transect one at top and one at middle. Walk groups to the furthest sample distance.	Listen Think about keeping all readings consistent in the method	Teacher method sheet
Activity Two (20 min) Collecting data	Groups will the same tree more than once – why? Sample 12 sites, time permitting, in total along the transect. All groups will have some information along transect. The distances between the stations could either be measured prior to the lesson and the trees marked using site numbers or by the pupils during the activity.	Pupils sample 12 sites. Measure between the sites	Sheet 4: Individual results Long measuring tape, trundle wheel
Activity 3 (10 min)	Class to be brought together. Recording sheets need collecting and slides and particle sheets.	Return to school Give in recording sheets and equipment.	

Homework – *None set*

Session 3: Post-fieldwork review in the classroom**Aim:** To be able to analysis class data and evaluate the experiment

Time	Teacher Activity	Student Activity / Differentiation	Resources
Starter (5 min)	Lesson title: <i>Is the air cleaner at the top of the hill?</i> Q - On board Where did we go? What did we do? What did you predict? If you have digital photos from previous session use these as a reminder, or in a story board.	Pupils explain answering these questions.	Digital photos
Activity One Demo and collecting data (15 min)	Have microscopes and hand lens distributed around the class. Using an OHP place slide onto and lay acetate with squares on top of it. Explain that we are going to sample the slides for the amount of black particles that we found. See method sheet on how to do this. Again this is a sampling technique. 'Sampling the sample' - Pupils attempt to do this using random numbers and working out an average % for each site (see more information on methods of this on teacher sheet). Pull class together. Note down on board problems with method.	Listen Observe Go to apparatus and get a slide Note down on sheet problems with method.	Microscope, hand lens, Slide with site sample, grid paper acetate, random number table. Use worksheet
Activity Two (25 min) Analysing Evidence	Distribute class results. Discuss. They are to find the average for each site. Ask pupils to draw graph for distance and particle percentage. Can a distance/ sound graph also be drawn? Could this be drawn on acetate to overlap? Would tree type and sound need to be added as extra columns on table? To analyse the graphs answer the questions on the 'analysis sheet' Discuss answers as a whole class	For lower attaining students the axis titles will need to be defined Draw graphs Write answers on sheet	Sheet 5 - Class results and graph paper. Sheet 6 – Analysis
Activity Three Evaluation (10 min)	Distribute evaluation sheet. Highlight the questions that will involve getting secondary data to back up your results by discussing the pollution monitors on the internet sites that have this information. Explain the task, found on the sheet. Pupils to discuss in pairs. Record answers and complete for homework.	Read questions and discuss in pairs	Sheet 7 – Evaluation
Plenary (5 Min)	1) Review the objectives and 2) Ask pupils to review learning using follow pyramid-  What do I find difficult? What was new and okay? What did I already know? Look at pyramids of pupils to get a feel for future lessons.	Pupils to complete triangle and to check homework	

Air Pollution – Notes for Teachers

In this activity, pupils will analyse the pollution along a transect running away from a road into open space.

Learning outcomes

Pupils will

Apply their understanding of air pollution sources to execute an investigation into the effect that black particulates have on a local environment and to consider the effect of other variables on these results.

Analyse and interpret individual and class data, to include evaluation of the data's validity and reliability

Evaluate their own methods

1) Planning

a) Introduction to the site

An introduction to the area and outline of the history and natural history of the site should precede the visit to the site. This research could be carried out and presented by pupils as a preparatory task.

If pupils are provided with knowledge of the basic techniques - choosing their sample sites, and sampling using sticky tape, the detailed planning of the investigation could be left to them. Planning would then involve planning investigations to be carried out in small groups or pairs, allowing a variety of methods to be discussed and evaluated later.

b) Choosing Sites along a transect running away from a road.

Collecting data along a transect is used to analyse changes along an environmental gradient such as going up a hill, or from the sea towards the shore. In this activity the environmental gradient is 'distance from the road'.

The ideal site for this activity is a road with some open space and trees close by, so the transect can run from the road into open space. A map of a suitable site could be downloaded from the Internet, or traced from a large-scale commercial map, and transects marked onto the map.

Line transects are marked e.g. with a long rope or tape-measure along the gradient. With line transects, samples are taken only along this line, at pre-determined intervals. Belt transects are similar, but are wider areas to be sampled along the gradient. In this case, trees will be sampled going back from the road across a wide area, so the sampling is more similar to a belt transect.

Sampling along the transect can be done by choosing similar species of trees along the transect (in this case at a range of different distances from the road). For example, one group could sample all the plane trees; another group could sample all the silver birch trees. Alternatively, mark sites to sample at equal distances along the transect. Both methods may be quite difficult; as trees at some sites may be widely spaced, a clear sequence of trees at regular intervals from the road along your transect may not be present. In this case it may be necessary to sample as many trees as possible in a wider sample area. This will introduce additional factors, such as proximity to other roads, which a straight transect attempts to eliminate. For this reason, pupils should collect as much data as possible about individual trees and their position within the site, so any anomalous results can refer to this data later.

c) Planning the investigation

Points for discussion during planning

Choosing the transect: which factors are changing along the transect (independent variable), and which factors are being kept the same as far as possible (controlled variables)? What will you be measuring (dependent variable)?

Sampling: How will you make sure your data is valid (repetition, standard procedure e.g. same height from ground, same aspect/ or take samples from all round circumference of tree), same type of sticky tape/ technique for applying same pressure each time you take a sample.

How will you keep your sticky tape samples safe, and in the correct order?

2) Suggested methods

a) At the site

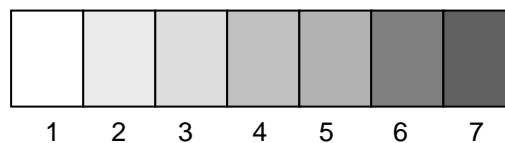
The species of the tree should be identified. A sample of particles is taken 2m from the base of the tree using sticky tape. A 2cm length of sticky tape is placed firmly onto the bark of the tree, and then removed. Soot and other particles from the air will have adhered to the sticky tape, along with debris such as loose bark and moss from the tree. Several samples should be taken (repetition), and discussion of how many repeats are needed is useful when planning.

One sample should be placed on a slide the others on the correct positioning of the results paper. Girth measurements of tree may be taken and recorded. Distance from road to first tree may be recorded Lichen may be observed and recorded noted down in the table. Lichens leads to a separate but linked investigation which is discussed in <http://www.nhm.ac.uk/jdsml/nature-online/lichen-id-guide/twig/pollution.html>. A data logger may be used to record the sound pollution.

b) Measuring pollution back in the lab

To measure the pollution on the sticky tape, the sticky tape samples are stuck onto a slide, and examined under a microscope. Mini quadrats should be made by photocopying graph paper onto acetates. An acetate grid should be laid over the pollution sample (sticky tape) and by choosing random coordinates the percentage frequency of black particles should be noted in the results table. Soot particles should be recorded, but bark and moss should be ignored. Hand lens and/or junior microscopes may be of use. Samples could be taken on the leaves instead/ as well as the bark of the tree. Instead of the ACFOR scale a colour scale could be used. Numbers would be assigned to the scale similar to pH indicators (see example beneath).

Colour scale to measure particles within a sample



An average from the samples for each site should be found and recorded, thus the 'sample should be sampled'.

The quantifiable data that will be collated and distributed to the class could include; distance along transect, percentage cover/ colour scale and sound recording. Along side this would be the qualitative information that the pupils collected at the sites.

3) Data analysis

It is advised that the results should be brought together from each group outside lesson time, to give one picture along the transect to analyse. This may not be possible if individual investigations have been carried out. Alternatively, pupils can produce their own presentations of their data as a follow-up from the data collection activity, and these can be discussed and evaluated by the class.

The sites/ trees used may be different between the groups but a spread of data along the transect should be extracted. (The only way to know if groups use exactly the same tree is if GPS is available, to log coordinates at each station, or the trees are labelled prior to the session).

The data can be put into a spreadsheet to be analysed or can be plotted in a graph by hand having distance from road along the x-axis and average percentage of particulates along the y-axis see exemplar materials in field materials folder. Sound could be also place on the opposing y-axis. Analysis worksheet could be used as prompts for the pupils to analysis the data and consider the social/ environmental aspect.

4) Evaluation

This investigation has many interesting areas to consider and really highlights the real work of scientists in the 'real world'. Pupils can use the prompt questions (evaluation worksheet 4) to consider how appropriate the methods were and the difficulties of controlling variables.

Hampstead Heath (Camden) – Site background information

Location

Hampstead Heath can be approached from many directions. The Education Centre is close to the entrance by Gospel Oak station. Grid reference TQ 282860.

History of site

Hampstead Heath comprises 792 acres of varied, irregular groupings of heathland, woodland, fields and formal grounds. The Heath, which is London's highest open space, is a survivor of the once great Middlesex Forest. Mainly south of it spreads the hill-town of Hampstead with its steep streets. More than two centuries ago it was a favourite refuge from London for wealthy lawyers, politicians and businessmen. By the early 1800s its fans included artists and literary men such as Gainsborough, Constable, Keats and Coleridge.

Responsibility for the Heath, which has large tracts of ecological importance including a Site of Special Scientific Interest (SSSI) (so designated by Natural England because of its outstanding geological and natural history importance), has rested with The Corporation of London since 1989.

Early 18th century	Hampstead becomes a spa and a township arises south of the Heath.
Early 19th century	The spa is only short lived and it becomes an increasingly popular place for residence.
From 1829	Lord of the Manor (Sir Thomas Maryon Wilson) attempts to sell or build on parts of the Heath much to public disapproval. His efforts, which were intermittent over 40 years mostly failed.
1850s	Sir Thomas tried in vain to turn the Heath into parkland. He also built a brickworks and increased extraction of sand and gravel from the Heath, an old, lucrative but environmentally unfriendly practice.
1860	Hampstead Heath station opens and the Heath becomes more accessible to the London population.
1869	Sir Thomas dies.
1871	Sir Thomas' brother, Sir John, having inherited the estate, agrees to sell his rights over the Heath in the Hampstead Heath Act.
1888	The Heath finally becomes public property when the Metropolitan Board of Works (MBW) takes possession of 240 acres of land and stops sand extraction on the Heath.
1886-88	Thanks largely to the efforts of the philanthropic Baroness Burdett-Coutts, founder of the National Trust, the MBW is able to acquire a

	further 261 acres of the Heath.
1888	London County Council (LCC) is formed and takes over responsibility for the Heath, reviving fears that it might be turned into a municipal park.
1907	There is a major addition to the Heath with the purchase of the Hampstead Heath Extension with both public and private funding, to counter the threat of building which had arisen due to the planning of a new tube station at Golders Green.
1925	LCC acquires Paddock.
Mid/Late 1920s	The house and estate of Kenwood, for generations the London seat of the Earl of Mansfield, becomes public property.
1939-45	During World War II, sand is extracted from the Heath to fill sand bags and the pits later filled with rubble from bombed sites in London. Oil from a lorry part kills many trees and bren gun carriers kill the last heather plants on Sandy Heath (now reinstated).
1948	LCC adds the gardens of war-destroyed houses to the Heath.
1954	LCC and Hampstead Council acquire part of Pitt House grounds.
1959	LCC acquires Hill Garden.
1986	Greater London Council (GLC), LCC's successor, is abolished. A New London Residuary Body takes temporary control of the Heath, excluding the Kenwood Estate, which is transferred to English Heritage.
1989	Corporation of London assumes responsibility for the Heath and maintenance of Kenwood.

Natural history overview

The higher parts of Hampstead town and all of Sandy Heath and West Heath are an outcrop, up to 25m thick, of Bagshot Sands, rare so near London. Much of East Heath and all of Parliament Hill Fields are on the clay of the Claygate Beds. In some places the sand appears coarse yellow, while in others it is finer and light in colour, mixed with loam and sandy clay. Below it lies at least 90m of London Clay, which is rich in fossils. Beneath that, lie the Woolwich and Reading Beds, Thanet Sands, Upper and Lower Chalk, Chalk Marl and Gault. In places the sand and gravel rest on spongy ground from which issue Hampstead's many springs.

The cessation of grazing and the removal of sand and gravel during the war years has allowed trees and shrubs to take hold on former open heath. The effect has been to turn much of what

was originally traditional heath into woodland. The Heath today contains areas of ancient woodland, bog, ponds, acidic grassland and other habitat types.

One of the Hampstead Heath Conservation Unit's main tasks has been to restore the West Field Bog, a S.S.S.I. Encroaching birches have been removed, dams made to increase the saturated area and the site fenced to help re-establishment, protect the sphagnum moss and encourage bog plants to grow again.

Other important conservation projects include hedgerows and coppicing. Hedgerows are renewed and strengthened while new ones are established. Coppicing is an ancient method of woodland scrub management that involves cutting certain species to the ground to allow multi-stem regeneration and gives greater diversity of habitats.

The large number of visitors to the Heath causes erosion on some patches of land. These patches are reinstated by planting native species and keeping the areas fenced until the planting has become established.

New conservation projects, such as experiments to create wildflower meadows, have taken place and over-intrusive sycamores have been removed to allow new grass, flowers and other trees to grow.

Hampstead Heath offers a diverse range of habitats attractive to many birds such as sparrows, starlings, kestrels, nuthatches, tawny owls and woodpeckers, and small mammals, including voles, water rats, weasels, grass snakes, slow worms, badgers and hares.

Web site

www.cityoflondon.gov.uk/openspaces

Contacts

Sam Crosby is the Education and Community Officer at Hampstead Heath.

020 7485 7073

RISK ASSESSMENT PRO FORMA 2006

Activity/Situation Air pollution study at Hampstead Heath from Highgate Entrance							Date of Assessment: Tuesday 6 th April 2006											
HAZARDS IDENTIFIED Grouped by Outcomes		PERSONS AT RISK FROM EXPOSURE TO HAZARD					RISK RATING WITHOUT CONTROLS IN PLACE	WITH CONTROLS IN PLACE										RISK RATING WITH CONTROLS IN PLACE
								A					B					
								WORST CASE OUTCOME					LIKELIHOOD /PROBABILITY					
NO.		Employee	Students	Visiting staff	Public	ALL	Worst Case Outcome X Likelihood / Probability	1 Inconvenience	2 Minor Injury	3 Injury / Illness	4 Major Injury	5 Fatality / Multiple	1 Unlikely	2 Rarely	3 Infrequently	4 Sometimes	5 Often	(A x B)
1	Slips, trips and falls – walking to site Temporary traffic furniture	x	x	x			2x3=12		2					2				4
2	Slips – wet leaves, moss & ice on tarmac	x	x	x			4x3=12			3				2				6
3	Hazardous Substances – Soil Borne diseases	x	x	x			5x2=10					5	1					5
4	Hazardous Substances – Fungi	X	X	X			4X2=10				4		1					4
5	Hazardous Substances – Glass, litter, faeces, syringes	x	x	x			5x4=20					3		2				6
6	Harmful plants		x				5x3=15					5	1					5
7	Manual Handling - Carrying equipment	x	x	x			4x2=8				4			2				8
8	Weather – Extreme cold					x	5x2=10					5	1					5
9	Weather – Extreme sun/ hot					x	5X2=10					5	1					5

10	Weather – High wind Tree branches/ dead wood					x	5x2=10					5	1					5
11	Traffic – Vehicles/ Car parks					x	5x3=15					5	1					5
12	Cyclists within park	x	x	x			5x3=15					5	1					5
13	Strangers		x				5x2=10					5	1					5
14	Getting Lost		x	x			5x3=15				4		1					4
15	Gardeners machinery – tools on path or adjacent to path	x	x	x			4 x 2 = 8			3			1					3

This pro forma does not replace school policy risk assessments. This can be used for guidance only. Site must be visited and assessed by teacher leading activity.

No	Risk Rating	THESE CONTROL MEASURES ARE TO BE IN PLACE. LEADING TEACHER TO ENSURE ACCOMPANYING STAFF AND ADULTS ARE CLEARLY BRIEFED, BEFORE THE START OF THE ACTIVITY REGARDING THEIR SUPERVISORY ROLE + ACTION TO TAKE IF ANY PROBLEMS OCCUR	Is additional action req'd? Yes / No
1	8	Safety talk given previous to leaving; walk single lane if obstacle on footpath. Staying in pairs along path. No running. Suitable footwear worn.	No
2	6	Verbal warning to students to walk & not run. Ensure an adult always positioned at front & back to maintain sensible pace. Pay particular attention if students are wearing inappropriate footwear. Ensure bags/coats are carried properly.	No
3	5	Safety talk given and symptoms told to pupils. All are to wash hands at end of session. Pupils told not to touch faces or put fingers near mouths.	No
4	4	Safety talk given. All pupils told not to eat any fungi seen, or berries etc.	No
5	10	Site to be used to be surveyed by group leader prior to lesson. Items should be removed using gloves or activity re-sited. In safety talk pupils must be told that they must not touch any item found and to be careful when on site. Pupils told not to put fingers in mouth or to eat. All to wash hands after. Pupils to report any item found to adult. Adult should remove item using gloves or ask pupils to move. Faeces should be removed by wearing clothes and disposal clothes, at school.	No
6	5	Safety talk given on not eating berries etc. and being aware of nettles. Show nettles to pupils when on site.	No
7	8	Pupils shown how to use and carry long tapes, etc. Pupils supervised at all times.	No
8	5	Pupils to be told to bring appropriate clothing; waterproof and extra layers. Teacher to monitor weather conditions. Play warming games if necessary	No
9	5	Pupils to be told to bring sun cream, sun hats and bottled water. Teacher needs to monitor weather conditions. Shade should be sort to work in where appropriate.	No
10	5	Pupils to be made aware of risk. Teacher to monitor weather conditions and change locations as appropriate.	No
11	5	Safety talks on walking to site. Pupils to remain in pairs; walk single lane if obstacle on footpath.	No

12	5	Tell pupils to be aware of others using park in safety talk.	No
13	5	Pupils to be advised that the park is a public space. Told not to talk to strangers and to stay with partner/ group. Report any incidents to members of staff.	No
14	4	Safety talk: group told to stay together. Pupils told to stay still if lost. Pupils and assistants to be told approx. length of activity. Mobile to be carried by lead teacher.	No
15	3	Insist that students do not touch any tools/machinery that they see.	No

Assessment carried out by: Melissa Glackin (FSC) and Andrew Turney (FSC) April 2006

This pro forma does not replace school policy risk assessments. This can be used for guidance only. Site must be visited and assessed by teacher leading activity.

Teachers/ group leaders before taking a group should:

1. Re-read school own 'off-site' policy
2. Carry a mobile that has reception at the site
3. Carry telephone numbers for the school office where pupil details are stored
4. Carry a basic first aid kit
5. Check the adult: pupil ratio is correct
6. Carry an up-to-date register

First Aid kits should contain –

- 1 first aid guidance leaflet
- 10 waterproof plasters
- 2 triangular calico bandages
- 1 large sterile dressing pad (18x18cm)
- 1 medium sterile dressing pad (12x12cm)
- 2 pairs of vinyl gloves (medium)
- 2 antiseptic wipes (alcohol free)
- 2 safety pins

KEY TO ASSESSMENT FORM 2006

PEOPLE AT RISK

KEY	DESCRIPTION
EMPLOYEE	EMPLOYEES INCLUDING VOLUNTEERS
STUDENTS	<u>ALL</u> students working with FSC
VISITING STAFF	All teachers / lecturers / adult helpers with groups
PUBLIC	When the general public have access to the area being Risk Assessed
ALL	All persons who are exposed to the hazard

SEVERITY OF OUTCOME

KEY	DESCRIPTION	GUIDANCE
1	Slight inconvenience	Verbal reassurance given, able to continue with activity
2	Minor injury	Requires First Aid, may be able to continue with activity
3	Injury / Illness	Medical attention required, unable to continue with the activity
4	Major Injury	As defined by RIDDOR, hospitalisation required, use of emergency services
5	Fatality, Multiple Injury	As defined by RIDDOR, injury may lead to a disability

LIKELIHOOD / PROBABILITY OF INJURY TAKING PLACE

KEY	DESCRIPTION	GUIDANCE ON DEFINITIONS
1	Highly unlikely to occur	
2	May occur	Rarely
3	Does occur	Not frequently
4	Occurs	From time to time
5	Likely to occur	Often

NOTE

When the final risk rating score is 8 or 9 everyone must be made aware of the hazards and the activity should be modified to lower the risk. If the score is 10 or higher the activity must cease .

The information given on the definitions can only be used as guidance and should not be referred to as the definitive version.