

## AQA A&B Science – Aquatic habitats – Mile End Ecology Park

### Specification links

#### 11.5 What determines which particular species lives and how many of them there are?

##### Specification Objectives:

*Candidates should use their skills, knowledge and understanding of how science works:*

- A to suggest how organisms are adapted to the conditions in which they live
- B to suggest the factors for which organisms are competing in a given habitat
- C to suggest reasons for the distribution of animals or plants in a particular habitat

*Their skills, knowledge and understanding of how science works should be set in these substantive contexts:*

1. To survive, organisms require a supply of materials from their surroundings and from the other living organisms there
2. Plants often compete with each other for light and for water and nutrients from the soil
3. Animals often compete with each other for food, mates and territory
4. Organisms have features (adaptations) which enable them to survive in the conditions in which they normally live
5. Animals and plants may be adapted for survival in the conditions where they normally live e.g. deserts, the Arctic
6. Animals and plants may be adapted to cope with specific features of their environment e.g. thorns, poisons and warning colours to deter predators

#### 11.8 How do humans affect their environment? (Only parts of)

##### Specification Objectives:

*Candidates should use their skills, knowledge and understanding of how science works:*

- A to analyse and interpret scientific data concerning environmental issues
- B to weigh evidence and form balanced judgements about some of the major environmental issues facing society, including the importance of sustainable development
- C to evaluate methods used to collect environmental data and consider their validity and reliability as evidence for environmental change.

*Their skills, knowledge and understanding of how science works should be set in these substantive contexts:*

1. More waste is being produced which, unless properly handled, may pollute:
  - **water with sewage, fertiliser or toxic chemicals**
  - air with smoke and gases such as sulphur dioxide which contribute to acid rain
  - land with toxic chemicals, such as pesticides and herbicides, which may be washed from land into water.
2. Living organisms can be used as indicators of pollution:
  - lichens can be used as air pollution indicators
  - **invertebrate animals can be used as water pollution indicators.**

Improving the quality of life without compromising future generations is known as sustainable development. Planning is needed at local, regional and global levels to manage sustainability.

**Assessment Objective 3 (AO3): Practical, enquiry and data-handling skills:**

- carry out practical tasks safely and skillfully
- evaluate the methods they use when collecting first-hand and secondary data
- analyse and interpret qualitative and quantitative data from different sources
- consider the validity and reliability of data in presenting and justifying conclusions

Candidates either singly or collaboratively take part in a practical procedure in order to collect primary data.

Candidates are assessed on their ability to analyse and evaluate the data collected and the limitations of the techniques used.

**Key activities**

1. Discussion of sampling and measurement of abiotic factors.
2. Pond dip with identification. Discussion of the adaptations of invertebrates for movement, buoyancy and oxygen supply.
3. Observing population numbers and constructing food chains and webs.
4. Collection of data at biotic and abiotic at 3 different sites.
5. Calculating a pollution index for each site.
6. Discussion on the importance of biodiversity in urban areas.

**Session 1: Pre-fieldwork activities in the classroom (1 hour)**

<b>Pre fieldwork activities</b>	<b>Resources needed</b>
<ul style="list-style-type: none"> <li>• Where is Mile End Ecology Park? What objectives are going to be met?</li> <li>• Pupils to compile a glossary of key terms in ecology</li> <li>• Directed reading task for pupils with comprehension questions based on newspaper articles</li> <li>• Pupils outline the risks that they observe and the precautions that need to be taken This could be organised as group-work with a plenary based on group posters and/or group presentations</li> </ul>	PowerPoint presentation Site background information for teachers Sheet 1: Ecology terminology Sheet 2: Directed reading Sheet 3: Can you spot the risks? Use PowerPoint presentation photographs

**Session 2: First fieldwork session (1½ hours)**

<b>Fieldwork activities</b>	<b>Resources needed</b>
<ul style="list-style-type: none"> <li>• Teacher introduction to Mile End Ecology Park and a brief history and overview of the site</li> <li>• Teacher models use of pond net for sampling</li> <li>• Pupils use pond nets, white trays and identification guides to sample the pond (it is useful for pupils to sample at least two micro-habitats, e.g. surface water, pond bottom, among weeds)</li> <li>• Identification of aquatic life. Discussion of adaptations of animals and plants to the surrounding habitats so that they are able to survive.</li> </ul>	Site background information for teachers Pond nets, white trays, id guides Sheet 4: Habitat observations Pond nets, white trays, id guides

**Session 3: Classroom review of first fieldwork session (1 hour)**

<b>Fieldwork activities</b>	<b>Resources needed</b>
<ul style="list-style-type: none"> <li>• Pupils to finish sharing group data and identifying organisms as necessary</li> <li>• Classroom discussion of the best methods to sample an aquatic habitat so that it can be compared to others. This can be set within the scene of a problem... Sheet 2 (Directed reading) reads that West Reservoir is under threat as new housing is to be built (similar to that on Green Lane). A site needs to be chosen from 3 areas within West Reservoir. Evidence needs to be collected either to prevent the houses from being built or to help choose the least damaging site.</li> <li>• Discussion to prepare for fieldwork session 2 - How can we compare the biodiversity in three aquatic areas?</li> </ul>	Sheet 2: Directed reading

**Session 4: Second fieldwork session (1 hour)**

<b>Fieldwork activities</b>	<b>Resources needed</b>
<ul style="list-style-type: none"> <li>• Teacher to check that pupils remember how to use pond nets for sampling</li> <li>• Pupils to collect biotic and abiotic data at three different sites</li> <li>• Pupils to share data in groups / class</li> </ul>	Pond nets, white trays, id guides, thermometers, light meters, pH meters or kits, oxygen probes OR dataloggers Sheet 5: Comparing different areas

**Session 5: Classroom review of second fieldwork session (1 hour)**

Fieldwork activities (1 hour)	Resources needed
<ul style="list-style-type: none"> <li>• Pupils to use trophic level cards to construct food webs</li> <li>• Pupils to use data collected to construct pyramids of numbers for the four trophic levels</li> <li>• Pupils to calculate a pollution index for each of the 3 sample sites</li> </ul>	Sheet 8: Trophic level cards Results recorded on Sheet 7 Sheet 9: Assessing pollution

**Post-fieldwork activities**

These activities may be carried out for homework after each of the fieldwork sessions or in the lessons following a 'field day'.

- Analyse data from the three habitats. How could such material be used to answer questions on biodiversity? Graphing techniques?
- A discussion of the usefulness of qualitative and secondary sources.
- Present findings in a report / spoken presentation.
- Consider the validity and reliability of data in presenting and justifying conclusions-
- Consider the conclusion drawn from the investigation from the view point of the developers how could they argue against the findings? Where and how might more data need to be collected?
- Using an up-to-date newspaper article on the decline on biodiversity consider how the report is written and what evidence is given for the importance of biodiversity. Some suggestions...

Article on why suburban biodiversity is important

<http://news.bbc.co.uk/1/hi/magazine/4579333.stm>

How the changes in the food web is pollutants are removed;

<http://www.guardian.co.uk/conservation/story/0,,1677851,00.html>

How changes occur in the food web if mammals are culled

<http://www.guardian.co.uk/conservation/story/0,,1692824,00.html>

## **Mile End Ecology Park (Tower Hamlets) - Site background information**

### **Location**

Area: 90 acres

Mile End Ecology Pavilion is near to Mile End Station (Mile End Road), off Grove Road and Burdett Road. Grid reference TQ 365824.

### **History of site**

Before the 1820s the land that is now Mile End Park was mostly fields. The Mile End Road was present, as was Grove Road. There were a few almshouses along the Mile End Road, but little else. A reservoir was situated where the mound in the park now is. The canal was completed in 1820 this leading to industrial development along the canal, and building on the Mile End Road. Much of the park was then covered with houses; some still remain, such as Haverfield Road, and the Palm tree pub. There were also industrial buildings such as oil processing works alongside the canal. There was also a gas works on the other side of the canal to the south of the park. The canal was built to link the Grand Union Canal with the River Thames. The canal was used mainly to transport coal into the heart of London. It was brought down from the North East of England by ship up the Thames and then put onto canal boats in the Limehouse basin.

A pleasure garden was attached to the Globe Inn, from which balloon ascents and other entertainments happened.

The area was bombed in the war, and the houses situated on the site of the park were mostly cleared in the *slum clearances* in the 1960s and 1970s. The area was left as bomb sites and little areas of green space gradually developed over the last 20 years, until the plan to develop the park was put into action.

### **Site web address**

<http://www.mileendpark.co.uk/summerflash.htm>

### **Site Contact**

Jayne Barber – Education Officer  
Contact number – 020 8981 3836

## **Key dates in the history of Mile End Park**

### **1381**

Meeting between Richard II and the peasant army led by Wat Tyler took place at Mile End Green

### **1944**

First V2 bomb drops on the site of Mile End Park

### **1950**

Creation of the Park out of the devastation of the Second World War and compulsory purchase of houses and factories

### **1960s**

Broken up by roads and railways, the Park has little positive impact on the surrounding area.

### **Early 1995**

The Millennium Commission make a first call for suitable projects to mark the millennium. The Environment Trust join with Tower Hamlets Council and East London Partnership to form the Mile End Park Partnership

### **September 1995**

300 people turn up to plan the Park at a Mile End Park Planning Weekend held at Guardian Angels School.

### **During 1995**

Planning stage for the Mile End Park bid, working with local community groups, schools, businesses, architects and environmentalists. Outline plan produced in November

### **December 1995**

The Millennium Commission indicates that they are satisfied that the quality of the scheme meets their high aspirations February 1996

The Millennium Commission announce approval of the Mile End Park bid, awarding a grant of up to £12.33 million.

### **May 1997**

The events and promotional programme starts with the Mile End Park Balloon Event, when the main pathway, mounds and Green Bridge are marked out in helium balloons.

### **January 1998**

Press Launch - building work starts in the new Mile End Park

### **June 1998**

Artsparkle (Midsummer Park Dreams) - a month of art installations, performances and workshops in the Park

### **September 1998**

Construction starts on Phase I - the Green Bridge and the Terraced Garden

### **July 1999**

Green Bridge span built over Mile End Road

### **October 1999**

Phase II begins

**RISK ASSESSMENT PRO FORMA 2006**

Activity/Situation							Date of Assessment:											
Pond Dipping / Mile End Park Ecology Centre (Tower Hamlets)							Thursday 6 <sup>th</sup> April 2006											
NO.	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					
							1	2	3	4	5	1	2	3	4	5		
		Employee	Students	Visiting staff	Public	ALL	Worst Case Outcome	Inconvenience	Minor Injury	Injury / Illness	Major Injury	Fatality / Multiple	Unlikely	Rarely	Infrequently	Sometimes	Often	(A x B)
1	Slips, trips and falls – walking to site Especially along canal.	x	x	x			4x3=12				x			x				8
2	Slips, trips and falls – walking to site Falling into canal	x	x	x			5x2=10					x	x					5
3	Slips, trips and falls – doing activity Falling into pond	x	x	x			5x3=15					x	x					5
4	Slips, trips and falls – doing activity Falling into canal	x	x	x			5x2=10			x				x				6
5	Hazardous Substances – Weils disease	x	x	x			5x2=10					x	x					5
6	Manual Handling Carrying equipment	x	x	x			4x2=8				x			x				8
7	Weather – Extreme cold					x	5x2=10					x	x					5
8	Weather – Extreme sun/ hot					x	5X2=10					x	x					5

9	Traffic – Car parks					x	5x2=10					x	x					5
10	Cyclists within park		x	x			5x3=15					x	x					5
11	Strangers		x				5x2=10					x	x					5
12	Getting Lost		x	x			5x3=15				x		x					4
13	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, <b>BEFORE</b> THE START OF THE ACTIVITY REGARDING THEIR SUPERVISORY ROLE + ACTION TO TAKE IF ANY PROBLEMS OCCUR	Is additional action req'd <b>Yes / No</b>
1	8	Safety talk given previous to leaving. Staying in pairs along path. No running. Suitable footwear worn.	No
2	5	Safety talk given previous to leaving. Walk half a meter away from canal edge. No running	No
3	5	Safety talk given previous to activity. Groups no large than four pupils. Only one pupil allowed dipping at a time. Float on a rope carried (by group leader). Pupils supervised at all times. Mobile phone carried. No running.	Float on rope needed
4	6	Safety talk given previous to activity. <i>A shallower area of the canal should be used in front of the pond.</i> Groups no large than four pupils. Only one pupil allowed to dip at a time, and pupils to knee near water. Float on a rope carried (by group leader). Pupils supervised at all times. Mobile phone carried. No running.	Locate shallower part of canal
5	5	All warned of dangers and explanation of symptoms and guidance letter sent to parents. Recommend that gloves are worn/ mirco-tape on wounds. Wash hands at end of session. No eating or drinking during activity.	Gloves needed
6	5	Pupils shown how to use and carry pond nets, trays etc. Pupils supervised at all times.	No
7	5	Pupils to be told to bring appropriate clothing; waterproof and extra layers. Teacher needs to monitor weather conditions. Play warming games if necessary	No
8	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
9	s	Safety talks on walking to site and through car parks. Pupils to remain in pairs.	No
10	5	Do not walk pupils on cycle paths. Stay to one side on towpath. Tell pupils to be aware of others using park in safety talk.	No

11	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
12	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
13	3	Insist that students do not touch any tools/machinery that they see.	No

**Assessment carried out by:** Melissa Glackin 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.