



Rail Trail Teacher's Pack

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ELR Irwell Valley Geography Rail/Trail

Introduction

The River Irwell flows north to south from the Rossendale Moors through Rawtenstall and Bury to Salford. It can be a fast flowing river with considerable run-off from the surrounding moors during periods of heavy rainfall. The valley was at the forefront of the Industrial Revolution in the 18th and 19th centuries, using water power to drive the machinery in the developing textile industry. Local coal to supply steam power was then utilised, as the mills increased output and expanded. The development of the railway was an essential part of this process, transporting coal and raw cotton to the mills, and finished products to the markets. At the same time towns and villages expanded considerably to house the burgeoning population.

Purpose

Using the East Lancashire Railway as access, to examine geographical features (both physical and human) in the upper Irwell Valley. The walk is mainly alongside the river with a gentle gradient in most places with a short easy climb in a couple of spots. It is not suitable for wheelchairs or those who have difficulty walking. During the walk the guide will highlight points of geographical, industrial and natural interest.

Suitability

Key stages 3 to 4.

Timings

Wednesdays, Thursdays, Fridays departing Bury at 1000, 1145 or 1400 hours, alighting at Rawtenstall, and returning from Irwell Vale at 1245, 1455 or 1645 hours.

Costs

£8.00 per pupil with one adult travelling free per group of 10.

What's Included

- Return train journey in reserved seats, with vintage steam engine.
- Worksheets and handouts.
- An expert guide.
- Teachers' reference material.

What to Bring

- Walking boots or trainers.
- Warm clothing, waterproofs (in the event of wet weather).
- Packed lunch/drinks.
- Notebook, pen/pencil.

Notes

Some of the features can only be seen from the train, or by walking the Rail/Trail.

Booking arrangements

Please contact the East Lancashire Railway Office for information about availability

Telephone

Denise Gill (Passenger Services Manager)
0161 764 7790 Email admin@east-lancs-rly.co.uk

By mail to

Admin Office
Bury Bolton Street Station
Bolton Street
BURY
BL9 0EY

Geography Rail/Trail – Background Information

Between Bury and Rawtenstall the East Lancashire Railway follows the valley of the River Irwell. The Irwell itself rises in the Rossendale Moors and flows north to south through Rawtenstall and Bury to Salford, where it forms the boundary with Manchester. Turning west, it merges with the River Mersey, flowing through Warrington and out into the Irish Sea below Liverpool. Almost all of the riverbed between Salford and Warrington has been engineered to form the Manchester Ship Canal.

Much of the valley between Bury and Rawtenstall was formed by glacial meltwaters at the end of the Quaternary ice ages about 25,000 years ago. It has since been occupied by the present day river. It can be a fast flowing river, with considerable run-off from the surrounding moors during periods of heavy rainfall. Geologically, the Irwell in its upper reaches flows through Millstone Grit overlain by Coal Measures. These are sedimentary rocks of the Carboniferous era, laid down approximately 300 million years ago.

Historically, the Upper Irwell Valley was at the forefront of the Industrial Revolution during the 18th and 19th centuries. Water power was harnessed to drive machinery for the developing Lancashire textile industry. As the mills expanded and increased output, local coal was used to supply steam power. The development of the railway was an essential part of this process, transporting coal and raw cotton to the mills, and finished products to the markets. At the same time towns and villages (Bury, Ramsbottom, Rawtenstall) expanded considerably to house the burgeoning population, eventually becoming part of the Greater Manchester industrial conurbation.

During the late 20th century many of the traditional industries in the Greater Manchester area went into severe decline, as the British economy changed from manufacturing to service industries. Railways were closed to make way for new roads and motorways, whilst new technological industries and business parks have replaced much of the Victorian industrial base. The railway that you are travelling on today once linked Bury with Bacup and Accrington, but was closed to passenger traffic in the 1960's. Only through the efforts of the volunteers of the East Lancashire Railway was it possible to re-open the line from Bury to Rawtenstall and to Heywood as you see it at the present time.

Geography Rail/Trail – What To See

Physical Features

- River erosion and deposition. In June 2002, for example, the river rose rapidly after a period of heavy thundery rain. “Scouring” of the foundations of Lower Ashen Bottom Bridge at GR796206 made the bridge unsafe, closing the railway north of Irwell Vale for 7 months
- Waterfalls
- Meanders
- River terraces
- Terracettes and soil creep
- Landslip. For example, in the cliff at Burrs GR803125
- Confluence of the Irwell and its tributary the Ogden at Irwell Vale GR792202

Man Made Features

- Quarries – for building stone
- Weirs – to harness water power and channel flow
- Bridges – Ewood Bridge is unusual in that it is one bridge built upon another. The earlier bridge was built by Blind Jack of Knaresborough in 1789 as part of the turnpike road to Haslingden. It was rebuilt in 1846, when the railway arrived
- Settlement – the rows of workers cottages at Irwell Vale are a classic example of a Lancashire mill village. Similarly at Summerseat
- Victorian Industry – Hardman’s Mill at Rawtenstall built in 1862 and now converted to a visitor centre, Hoyle’s Mill at Summerseat built in 1873 and now converted to residences
- Modern Industry – business parks and industrial estates at Rawtenstall, paper mills at Stubbins and Ramsbottom
- Industrial Archaeology – at Stubbins there are the remains of a railway junction and station and further northwards an embankment and viaduct, which carried the line to Accrington
- Water Abstraction – for the sewage works at Ewood Bridge, and for the paper mills at Stubbins and Ramsbottom

Rawtenstall and district local information

Rossendale Museum in Whitaker Park deals with the social history of the area and covers road transport, clog making, furniture, art and even one skilful display on the art of taxidermy. The building dates from 1840 and was built for the Hardman family who made their substantial fortune from cotton.

In 1902 the family had left and the house had opened as a museum.

The very name Rawtenstall is old English and simply means "a roaring pool."

This is accurate because the Irwell in this section flows quickly and on its banks is the Hardman Mill, now the base for the Rossendale Groundwork Trust.

This point marks the start of the Irwell Way Sculpture Trail.

Among the exhibits are the Bocholt Metal Tree, named after the German town which is twinned with Rawtenstall.

At nearby Cloughfold is a sculpture called Logarithms, which is a pile of carved logs.

The Hardman family rebuilt their old mill in 1862 and its impressive architecture is still in evidence today and helps to set the town in context.

The quarrying industry in Rossendale was mainly concerned with the series of hard Millstone Grit sandstones of the area (within which are interspersed shaley mudstones and narrow coal seams), although other sandstones were extracted. The specific deposits relevant to the valley of stone are as follows:

- Rough Rock – softer, coarser-grained stone with pebbles of quartz and feldspar up to ¼ “ long. Many earlier quarries were situated on this rock. It was more suitable for ornamental work than the harder stones.
- Upper and Lower Haslingden Flags – better, harder, fine-grained sandstones that formed the basis of the nineteenth-century boom in the local industry (within these deposits, the locally known ‘Lonkey’ stone was viewed as the best). Generally considered too hard for ornamental work.
- Dyneley Knoll Flags of Lower Coal Measures – quarried from at least the medieval period.

Haslingden flag is a durable carboniferous sandstone. Mixing pleasantly warm tones of brown it will quarry and dress as large flagstones which do not become slippery when wet. For this reason it paves some of Britain's more prestigious public places like Trafalgar Square. You can see the quarry from the pub, just beyond that sheep over there.

Irwell Vale stands where two rivers - the Ogden and the Irwell meet and owes its existence to John Bowker, a Manchester merchant. Bowker built a woolen mill on the east side of the Irwell in about 1800 and some thirty-two years later added a cotton mill on the opposite bank. In 1833 two rows of workers' cottages were completed and the new village had been born. For many years the mill was leased to the Aitken family and eventually they bought the entire village. The street names, Aitken Street and Bowker Street, recall them and the original owner.

River Irwell

The Irwell is about 39 miles (63 km) in length, from its source to the confluence with the [River Mersey](#).^[1] Rising on the moors above Cliviger,^[2] the river flows south through [Bacup](#), [Rawtenstall](#), [Ramsbottom](#) and [Bury](#) before merging with the [River Roch](#) near [Radcliffe](#). Turning west it is joined by the [River Croal](#) near [Farnworth](#) where it turns southeast through [Kearsley](#), [Clifton](#) and [Agecroft](#), meandering around [Lower Broughton](#) and [Kersal](#), [Salford](#) Crescent and the centre of [Manchester](#), joining the rivers [Irk](#) and [Medlock](#). Again turning west, from Salford, it meets the Mersey to the east of [Irlam](#), where the route was altered in the late 19th century to form part of the course of the [Manchester Ship Canal](#).

The Irwell is all that remains of the shallow seas that covered most of south-east Lancashire in the [Upper Carboniferous](#) era, when deposits of mud and sand were laid down. During the [Permian](#) and [Triassic](#) periods, red [sandstones](#) were deposited under arid, desert conditions and these became compressed into beds of [shales](#), [New Red Sandstone](#) and Manchester [marls](#), alternating with layers of [gritstone](#).^{[1][2][3]} The [glaciers](#) of the [Pleistocene](#) period radically re-shaped the landscape and then retreated, leaving behind deposits of sand, pebbles and [boulder clay](#) that formed the [fluvioglacial ridges](#) of the lower [Irwell Valley](#)

The origins of the name "Irwell" are uncertain but many accept the [Anglo-Saxon](#) origin, *ere-well*, meaning "hoar or white spring"

River Ogden

The confluence of the Rivers Ogden and Irwell at Irwell Vale

The **River Ogden** is a river in [Lancashire](#), [England](#), formed by Musbury Brook, Alden Brook and Swinnel Brook. It passes through [Ogden](#) and [Calf Hey](#) Reservoirs and joins the [River Irwell](#) between [Rawtenstall](#) and [Ramsbottom](#).

Tributaries of River Ogden

- Alden Brook
- Musbury Brook
 - Hare Brook
 - Long Grain Water
- Swinnel Brook
 - Sunny Field Brook ?
 - Duckworth Brook
 - Sherfin Brook
- Deep Brook
- Hog Lowe Brook


EAST LANCASHIRE RAILWAY
EAST LANCASHIRE RAILWAY CO. LTD

BOLTON STREET STATION - BURY - LANCASHIRE - BL9 0EY

RISK ASSESSMENT

This document is aimed at providing you with an indication of the potential risks involved in a visit to the East Lancashire Railway. It gives information about how the risk is controlled and what additional steps may need to be taken to safeguard both adults and children.

HOW OUR RISK ASSESSMENTS ARE MADE

In its simplest form, there are two elements to any risk. They are:

The likelihood of the risk occurring [L]]

and

the consequence of the risk occurring [C]

the total risk [T] for any activity is the product of those two factors, so

$$T = L \times C$$

The final value of T is the most important consideration

Value of T	Consequences
1 to 9	Acceptable minor risk, unlikely to actually happen and with minimal consequences should it occur
10 to 18	Significant risk, with steps needed to be taken to reduce the risk
19 to 25	Unacceptable risk, meaning the activity should not be undertaken under any circumstances

The following table shows how **Likelihood** and **Consequence** are scored.

Score	L	C
1	Very unlikely, remote chance of occurrence	Nil or minor injury, possibly requiring first aid
2	Possible chance of occurrence	Minor injury, possibly requiring medical attention and time to recover
3	Probable chance of occurrence, likely to happen	Serious temporary injury, such as broken limb
4	Very likely to happen	Permanent injury causing disability
5	Highly likely to happen at any time	Death

Overleaf, tables of risk assessments for the station and train can be found. If your group has pupils with Autistic spectrum disorders, emotional and behavioural problems, or problems with vision or hearing, please consider the support staff situation carefully.

RISK ASSESSMENTS FOR EDUCATIONAL VISITS

Risks around East Lancashire Railway stations

<i>Hazard</i>	C	Risk control	L	T	<i>Action required</i>
Uneven walking surfaces Slips and falls	2	Instruct all concerned to wear appropriate "sensible" footwear Safety talk advises on platform surfaces etc	3	6	Running and playing not permitted Keep group members close to leader Point out hazards as group moves around site
Raised platforms at stations Slips and falls	5	Close supervision of groups by leaders Safety talk advises on dangers	2	10	Running and playing not permitted Keep group members close to leader Keep well behind white edge safety line Stand still when train approaches
Slippery surfaces Slips, trips and falls	2	Instruct all concerned to wear appropriate "sensible" footwear Safety talk includes wet surfaces if appropriate Safety talk instructs group on use of stairs	2	4	No running, particularly on stairs Keep group members close to leader Point out potential hazards as group moves around site
Platform furniture obstructions	2	Remind party to look where walking – signal gantry [wires and ladder], tables, chairs	2	4	Do not allow running Point out perceived hazards as group moves around site

RISK ASSESSMENTS FOR EDUCATIONAL VISITS

Risks around East Lancashire Railway trains

Hazard	C	Risk Control	L	T	Action Required
<p>Passenger operated coach doors without central locking</p> <p>A very serious, potentially fatal, fall is possible</p>	4	<p>Brief group about door operation</p> <p>Do not allow children to operate doors</p> <p>Designate adults open/close doors</p>	3	12	<p>Close supervision of group members</p> <p>Children not allowed to "explore" the train unsupervised</p> <p>Children in groups, each with designated leader</p>
<p>Inter coach connections where hands or feet may become trapped between moving surfaces when train is in motion</p>	2	<p>Brief party about this feature</p> <p>Do not allow children into coach connection area unsupervised</p>	1	2	<p>Close supervision of group members</p> <p>Children not allowed to "explore" the train unsupervised</p> <p>Children in groups, each with designated leader</p>
<p>Climbing on tables and seats</p> <p>Likelihood of falls, particularly when train is in motion</p>	3	<p>Brief party members concerning required behaviour</p> <p>Group leaders o monitor behaviour regularly</p>	2	6	<p>Effective supervision by all responsible adults</p>
<p>Loud noises from locomotives</p> <p>These occur without warning and can be frightening/ piercing/deafening</p>	2	<p>Brief party members about this possibility</p> <p>Consider supervision provision for pupils with autistic/EBD disorders</p>	5	10	<p>Position party clear of locomotives and platform edges</p> <p>Accompanying staff close to vulnerable pupils at appropriate time</p>

RISK ASSESSMENTS FOR EDUCATIONAL VISITS

Risks around Irwell Valley Way: Rawtenstall to Irwell Vale

Hazard	C	Risk Control	L	T	Action Required
<p>Uneven surfaces of soil, grass clay and stone</p> <p>Trips and falls may occur, particularly when clay surface is slick</p>	1	<p>Advise group of particular conditions on path, section by section</p>	2	2	<p>Close monitoring of group on relevant sections</p> <p>Arrange message passing system to warn of obstacles/tricky bits</p> <p>Demonstrate sideways shuffle for puddles on clay</p>
<p>Steep [but short] uphill gradients: 2 sections, both with steps available</p> <p>Slips and falls may occur</p>	2	<p>Advise group of particular problems:</p> <ul style="list-style-type: none"> • Loose stones if dry • Slippery wood edges if wet 	2	4	<p>Close monitoring of group</p> <p>Ensure adults “top and tail” with extra staff spaced out through the party to reduce risk</p>
<p>Road crossings</p> <p>Traffic hazards likely</p>	3	<p>Brief group as each road section is approached:</p> <ul style="list-style-type: none"> • C class road by mill and industrial estate at Townsend Fold • B class road at Ewood Bridge • C class road at Irwell Vale 	1	3	<p>Close monitoring of group and traffic.</p> <p>Ensure party closed up to cross “B” road at Ewood Bridge – staff positioned to stop/control traffic</p>
<p>Nettles, brambles</p> <p>Stings and scratches likely</p>	2	<p>Brief party on appearance of relevant plants and remedy of dock leaves for nettle stings</p>	4	8	<p>Put message passing system in place so group can be warned of proximity of relevant plants</p> <p>Carry some dock leaves for emergencies</p>

Geography River Processes Test Sheet - Solutions

1. Rivers shape and change the landscape around them through processes. These processes are called :

Answer C = Erosion, transportation and deposition

2. Which answer is the odd one out?

Answer C = Percolation

3. Rocks and pebbles being carried by the river knock together and are broken down to form smaller particles. This process is called **attrition**. Solution or **infiltration** is when weak **acids** in the water dissolve rock particles and minerals. Hydraulic action is when the force of the **water** being carried by the river wears away the bed and banks. Abrasion occurs when the **material** being carried by the river wears away the river bed and banks.

4. The following statements about deposition is incorrect?

Answer C = Deposition is more common at the source of the river

5. Near the source of a river, in the upper course, erosion is **vertical** or downwards. This is because the water is being pulled downwards by gravity. This forms deep **V-shaped valleys**. Near the mouth of a river, in the lower course, erosion is **lateral or sideways**. This forms a wide river channel. Rivers use energy to transport material. Energy levels change as a river moves from source to mouth. When energy levels are very high, large rocks and boulders can be **transported**. Energy levels can be very high in times of flood. Energy levels are lowest when the river enters the final stages of its journey at the mouth. **Deposition** is common towards the end of a river's journey, at the mouth.

6. Flooding occurs when:

Answer C = A river bursts its banks

7. Look at the statements below. Which of these factors does NOT encourage flooding?

Answer B = a drainage basin made of permeable rock

8. What is a flood hydrograph?

Answer A = flood hydrograph is a graph illustrating changes in river discharge over time.

9. The difference between the time of peak rainfall and time of peak discharge shown on a flood hydrograph is known as

Answer B = Lag time

10. There is more chance of flooding on floodplains, so what is the main reason why people choose to live on or near floodplains?

Answer A = The silt (alluvium) that is deposited during flooding makes the floodplain fertile and therefore is ideal land for growing agricultural crops.

11. Many dams have been built by governments and international development organisations arguing that dams help to reduce the risk of flooding. However dams aren't always good news for everyone. Which one of the following is a disadvantage of building dams?

Answer B = Sediment is often trapped behind the wall of the dam, leading to erosion further downstream.

Easy Word Puzzle - Solution

Q	W	E	R	B	A	N	K	E	R	O	S	I	O	N	P
A	S	D	F	O	A	S	D	F	G	H	J	K	L	L	O
Z	X	M	O	U	T	H	G	H	M	E	R	R	T	Y	U
Z	X	C	V	L	N	M	L	K	E	S	T	U	A	R	Y
F	L	O	O	D	Q	W	E	R	A	S	A	S	D	F	G
D	S	A	Q	E	W	C	R	T	N	U	T	Y	T	R	E
Z	X	C	V	R	M	N	B	V	D	X	T	C	V	B	N
U	O	P	O	S	O	U	R	C	E	B	R	R	E	W	Q
I	A	E	O	U	Q	R	A	Z	R	A	I	N	E	R	T
D	D	E	L	T	A	S	A	S	D	F	T	G	H	J	K
Q	W	E	A	X	C	E	B	N	M	Z	I	A	S	D	F
R	W	Q	K	N	M	A	S	D	F	C	O	U	R	S	E
G	F	D	E	P	O	S	I	T	I	O	N	A	S	D	F

Find the following words hidden in the grid above

DELTAS
 BOULDERS
 EROSION
 MOUTH
 FLOOD
 MEANDER
 SOURCE
 ATTRITION
 DEPOSITION
 ESTUARY
 BANK
 COURSE
 RAIN
 LAKE

Geography Difficult Word Square - Solution

P	Q	W	E	A	R	T	R	A	N	S	P	O	R	T	A	T	I	O	N	V
L	D	F	T	V	T	Y	S	M	E	A	N	D	E	R	J	L	M	Z	G	V
M	B	A	N	K	G	T	S	O	Y	P	E	V	D	M	O	O	W	R	N	X
N	Z	X	H	R	C	T	R	L	U	L	P	S	K	E	K	C	C	E	J	B
N	R	E	E	R	R	S	D	I	C	R	N	N	P	P	L	R	K	J	K	D
E	M	N	S	E	G	K	E	I	T	S	C	B	M	N	M	T	K	S	E	B
S	E	J	A	N	F	L	T	S	A	I	O	E	B	D	S	R	A	P	R	O
T	R	M	X	S	O	R	Z	L	S	U	O	X	Y	E	B	W	O	S	R	U
U	S	E	D	J	A	I	T	P	L	E	T	N	S	Y	L	S	Y	L	T	L
R	V	L	T	P	Y	A	T	D	E	N	C	A	L	Z	T	P	Q	R	W	D
A	Y	F	K	A	T	N	E	C	O	E	E	O	B	T	A	M	A	F	N	E
Y	W	C	N	I	W	R	O	I	A	R	T	E	R	R	M	C	O	O	N	R
E	O	C	O	D	S	W	S	I	C	C	K	S	T	P	T	F	I	U	F	S
R	R	N	R	W	R	A	O	E	T	A	I	I	S	I	R	T	R	L	T	T
T	H	O	S	F	R	G	D	L	L	I	C	L	O	I	U	E	O	M	R	H
G	Z	N	S	B	R	R	N	D	L	L	S	N	U	L	E	O	V	Z	R	T
B	R	T	A	I	T	T	H	D	E	A	K	O	O	A	D	S	M	I	K	B
V	Z	N	M	D	O	R	P	S	N	V	H	S	P	G	R	Y	R	J	R	B
C	T	V	Y	M	G	N	K	Q	W	E	R	S	T	E	M	D	V	U	T	D
X	N	S	A	L	T	A	T	I	O	N	R	X	L	Z	D	L	Y	Q	O	R
S	R	N	O	I	S	N	E	P	S	U	S	V	O	L	U	M	E	H	W	C

Find the following words which can be in any direction

Abrasion
 Meander
 Attrition
 Mouth
 Bank
 Particles
 Boulders
 River processes
 Course is steep
 Rock particles

Decreases
 Rocks
 Deltas
 Saltation
 Deposit
 Shallow water
 Deposition
 Solution
 Energy
 Source

Erosion
 Streams
 Estuary
 Suspension
 Flood
 Traction
 Hydraulic action
 Transportation
 Lake
 Volume