

Science Spotters - Activity Guide

Purpose: To start to explore and understand some of the 'everyday science' that was used in the running of the Cromford and High Peak Railway.

Time: Approximately 45 minutes

Location: Various, around the workshops and up to the catch pit (see map)

Resources: Science spotters quiz sheet with map on reverse (1 each or 1 between 2, or 1 per group), (**printed in advance at school**), set of supporting old photos (laminated ones available in HPJ resource box)

Teaching notes:

Depending on your class you may want to do this as an activity led by yourself around the different locations, where you can question the children about what they can see, how it would have worked etc. they could then have a go at completing the Science Spotters Quiz before moving onto the next location.

Alternatively, you could set the children off in groups with an adult for each group to explore the different locations, or you could let them work in pairs, with supervising adults based at the different locations to help as needed.

However you choose to organise this activity the idea is that pupils find their way to each location on the map (apart from location 4, the A6 road bridge, which is for reference only). They can look at the historic photo taken near by and then have a go at answering the questions on their science spotter sheets.

Background information about the site and different locations

The area around High Peak Junction was shaped by the canal and the railway eras. It was the original southern terminus of the Cromford and High Peak Railway (now the High Peak Trail). Unusually the railway was built as part of the canal system linking the Cromford Canal to the Peak Forest Canal.

The **High Peak Junction Workshops** were built in 1825 to serve the Cromford and High Peak Railway; the buildings were last used as a workshop in 1967. They have been preserved in their original state. Either side of the inspection pit are lengths of 'fish bellied' rails, so called due to their shape. This is possibly the oldest section of railway line still in situ in the world.

Location 1 – The Forge

The workshops were used to maintain the railway tracks, locomotives and wagons. A key part of the workshop was the forge, where skilled blacksmiths could turn a piece of metal into a new part for the railway or repair a crucial part for a wagon.

Location 2 – The Water Tower

The water tower (which was extensively restored in 2006) is the only remaining water tank used to supply the railway company and its locomotives. Water tanks like these were situated along the railway line, where steam locomotives could fill their tanks when needed. Tanks like this would have been filled by locomotives carrying water up from the 'lowlands', as on the limestone uplands, water was in short supply.

Location 3 – The Wheel Pit

When the railway was first built the wagons were pulled by horses along the railway tracks, there is no way that a horse could pull a wagon up these steep sections, even when steam locomotives were invented they

would not be powerful enough to get up these inclines, which is why this system of hauling up the wagons was used. This wheel pit is at the foot of Sheep Pasture Incline (1,200 metres long and climbs 140 metres). Wagons were hauled up this incline on a continuous wire rope, descending trucks were usually used to counterbalance ascending trucks. The wire rope was moved by static steam engines positioned at the top of each incline. The Wheel Pit housed the return wheel for the rope and could haul 2 full wagons or 5 empty ones upwards at a time.

Location 5 – The Catch Pit – note you need to carry on past the catch pit to the information board on the right hand side of the track to fully understand how the catch pit was used, then you can go into the catch pit for a closer look.

The Catch Pit was built following an accident in 1888, in which 2 runaway wagons jumped across both the canal and the Midland Railway! Uphill from the Catch Pit, all the wagons tripped a series of gongs. If these rang out at a controlled speed, then the points were set to allow the train to continue onwards to the bottom. If they rang too fast then the points were set to allow the runaway train to come to an abrupt, but harmless, halt in the Catch Pit. The last runaway occurred in the 1950's - the wreckage can still be seen!



Science Spotters Quiz

Use the map to visit the different locations and think about the different aspects of science that were being used to make the Cromford and High Peak Railway function.



Everyday materials (location 1 - The Forge)		
1	Why did the blacksmith heat up the metal?	
2	What did he do to the coal in the forge to make it hotter?	
States of matter (location 2 – The Water Tower)		
3	Why did they need huge water tanks?	
4	How does water change state when it is heated?	
Forces (location 3 – The Wheel Pit)		
5	What force is being reduced by wagon wheels running on smooth rails?	
6	How did they counterbalance the loads going up and down?	
Sound (Info board on the right just past location 5 – The Catch Pit)		
7	What does the points man need to listen out for?	
8	What do the different sounds tell him?	



Note the Water Tower at the bottom of Sheep Pasture Incline, just past the LMS wagon (1945)
(location 2)





The 'Pointsman' ready to send a wagon down the incline or down into the Catch Pit (1890)
(To understand what a 'Pointsman' does go to the information board on the right just up past location 5)

High Peak Junction Workshop 1880
(location 1)



A wagon attached to the wire rope just up from the Wheel Pit, ready to be pulled up the incline. Note the man changing the signal, so the people at the top of the incline know that it is ready to go (1966)

(location 3)

