



Central Tramway Company, Scarborough Educational Resource Pack for Primary Schools



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The top station dates from 1881 when the Tramway was first built. It has had a recent update including new paint work and signs (see page 13)

PRACTICAL INFORMATION

Address: Upper Station, Marine Parade, Scarborough, YO11 2ER.

Parking: Parking is limited but there is on street parking available by the Grand Hotel at St Nicholas Cliff, at the Palm Court Hotel on Falconers Road, or alternatively on the sea front on the Foreshore Road where the bottom station is located.

Please check parking arrangements before your visit.

Opening days and times: Central Tramway operates a seasonal timetable so opening times may vary from month to month. December and January are traditionally our shut-down period when the Tramway is closed for essential maintenance.

The rest of the year the Tramway is open from 9.30am – 4.45pm and later during the peak summer periods.

All school visits must be pre-booked with the company. The cost is £1 per child with accompanying adults free of charge. Included in this cost is a poster of 'How the Tramway Works' for each classroom (1 per class), and a postcard for each child visiting as a souvenir of their visit.

Bookings can be made via email or phone.

Education and community engagement contact: Colin Powell:

Email: gm@centraltramway.co.uk

Tel: 01723 501754

General Manager: Colin Powell

Tel: 01723 501754

Access: Disabled access/ Blind facilities

Facilities: Tram ride / Gift Shop / First Aid

Central Tramway adheres to all current government guidance regarding C19. The following information is for reference only and all group bookings must be booked in advance.

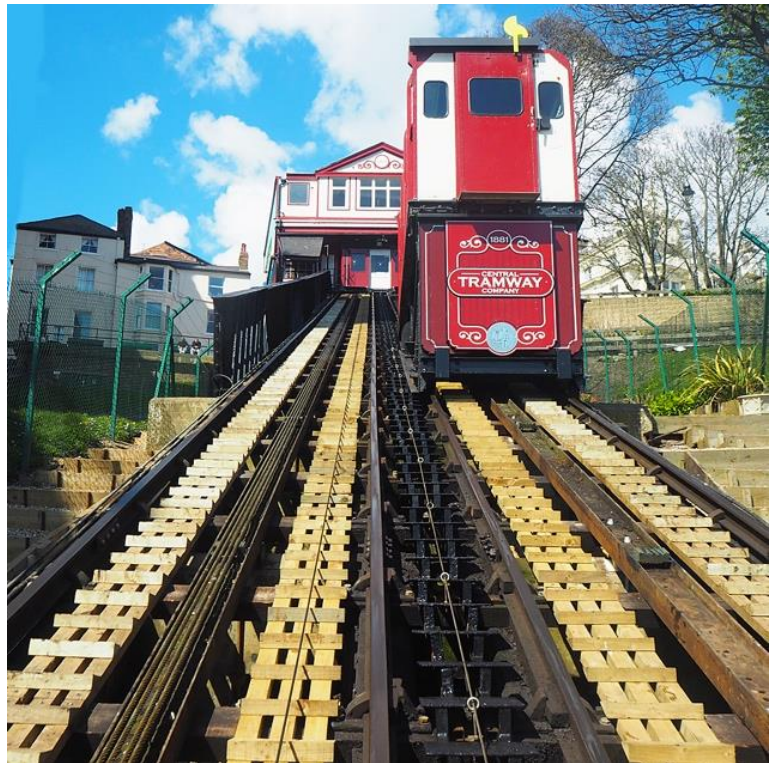
Please email to request further information including risk assessments, or to book a visit.

INTRODUCTION

Central Tramway is the oldest surviving tramway company in the UK. The company is family run and has been managed and maintained by the same corporation since being established in 1881.

With a legacy that is steeped in Victorian engineering and technology, the lift primarily functions to offer locals and visitors to the area the opportunity to travel the cliff face between the Foreshore and Marine Parade.

The Central Tramway Company is focused on the safe and efficient transport of its almost 500,000 annual passengers. We are also committed to ensuring the tramway's survival for future generations and to celebrating its rich history.



As a heritage attraction, we value and promote learning. The Central Tramway Company is a place where children can interact with, and experience the development of science and technology from the Victorian era and our hope is to bring the past to life through educational visits and information.

We pride ourselves on being a cross-curricular attraction. We have strong links with the National Curriculum, and on site we are able to cover both core and foundation subjects (English, Maths, Science, Geography, History, Art, and Technology).

This pack is designed to enhance learning and understanding and is accessible to all ages and abilities. There are a wide range of topics for children to engage with and a great deal of information to be taken away at the end of their visit.

Our resource pack contains everything you will need for a fulfilling visit. The notes we provide are merely a guide to help set the scene for the Central Tramway and show how it has remained much the same since its creation in 1881. If you choose to use the notes, it is recommended that the children take time to stop and examine their surroundings in order to think about the information being presented. We have also devised a series of activity sheets that you can do either before, during and/or after your visit to the Central Tramway Company. We have supporting resources available to enhance classroom learning including 3 books. Learn more about these publications by emailing gm@centraltramway.co.uk.

It is important to all of us here, that your visit should be educationally valuable, but we also want it to be an enjoyable experience and one that makes a lasting impression.

THE NATIONAL CURRICULUM AT CENTRAL TRAMWAY

This section outlines the National Curriculum subject areas and aims covered by a visit to The Central Tramway Company. Many of the activities and discussion points are intended to be carried out on site, while others are suggested extensions for the classroom after your visit.

ENGLISHReading Comprehension:

Explore the signs and posters around the stations and tram.

Discuss new vocabulary and technical terminology (when age and stage-appropriate).

Read and discuss the Poems on the Tramway

Tom and the Tram – a story book ideal for children aged 3-6 – a separate resource pack is available for this book on request.

Writing

Opportunities to write in various genres – interview, explanation, diary, newspaper article

MATHSCounting

How many people can safely ride in the tram?

How many people are in your tram?

With two full trams, how many are riding altogether?

Measurement

Using your feet, measure the length/width of the station (inside).

Using your hand span, how wide are the windows of the tram carriage?

Time how long it takes for a carriage to reach the top/bottom station. Does it come close to your estimation?

Geometry

Use appropriate language to describe the position and placement of the trams on the track.

Angles – look at the incline/decline of the track.

What type of angle is produced when you draw the track, the ground and connect the two?

Exploring Shapes

How many different shapes can you identify in the top and bottom stations? (Outside)

Why do you think the tram carriages are shaped like they are?

Estimating

Estimate the number of people who travel on the tramway every day. (Think about seasons and holidays – will these factors affect your number?)

Estimate how many children you think would be able to fit in the carriage. Now estimate how many adults.

Before your tram ride, estimate how long it would take a carriage to reach the top/bottom.

Statistics

Conduct a simple survey eg. number of passengers travelling on each tram in a given period of time. Follow up at school: construct a bar chart and discuss findings.

Record the number of adults/children/pets to travel in one carriage on one journey.

SCIENCE

Investigating Materials

What are the Central Tramway carriages made from and why?

How often are the cables/ropes replaced?

Which factor causes the most corrosion/wear and tear to the track and cables? Weather or number of tram rides? Give reasons for your answer.

What are the benefits/disadvantages of using wood and canvas or metal? Think about how often you would have to replace materials.

Forces

Identify and understand the different forces that are used in powering the trams.

(Scientific terminology – gravity, push and pull, friction, tension)

Discuss and identify the use of levers, pulleys and gears within the Tramway mechanism.

Senses

Use the 5 senses to describe and communicate your experience at the Tramway.

Investigate Sounds

These skills are covered and enhanced as part of your tram ride.

GEOGRAPHY

Using Geographical Vocabulary

Throughout the site visit children should be encouraged to use key geographical vocabulary when describing their surroundings.

What is the terrain like around the Central Tramway?

What type of location is the Central Tramway located in? Urban, rural, coastal? Explain your answer.

Locate Scarborough on a map of England; locate Central Tramway on a map of Scarborough.

Use simple compass point directions, locational and directional language to construct and describe simple maps and plans of the Tramway.

Ordnance Survey maps from different time periods can show developments in the landscape and the surrounding towns/villages.

Map out the human and physical features of the local area.

Human Geography

What are the transport methods chosen by visitors when coming to visit the Central Tramway?

Why do you think the Central Tramway has more visitors during the months April to September?

What are the other buildings around the Tramway – why have these developed over time?

Population density in towns compared to the countryside.

Would this difference affect the numbers visiting the Central Tramway in the past?

Look at the development of Scarborough and the wider area as a settlement and examine how it has developed over time.

ART

Make detailed sketches of the following:

Carriages • Cart (top station) • The Tramway does not offer a ticket to ride, if they did what might it look like? Design a ticket to ride the tramway.

HISTORY

We have provided an information sheet (pages 9-11) and related questions (page 18) to offer a historical context to the Central Tramway Company. It is hoped that by using these materials and visiting the Tramway your teaching of the history curriculum is fully supported.

Identify the Differences Between the Past and the Present.

Using the photograph pdf of the Tramway discuss how it has changed over time. Look at the buildings (top and bottom stations), what features can you identify that show different periods in time? (Look at the decorations and materials). Sequence the photographs in chronological order and discuss their reasons.

Create a timeline of Central Tramway's history.

Talk about their own experiences of visiting the Tramway in the past and how is this visit different.

Consider and discuss what differences there could be in visiting this attraction during the Victorian period, World War 1 and 2 and present day.

Using the mural at the bottom station compare differences between fashion from the Victorian period to that of today.

Using a Range of Historical Sources.

Look at images from the log book. How have the numbers changed over the years? Do the number of passengers change according to the time of year? Do you think the number of visitors would have changed during times of war? Why might that be?

Look at the additional resource pack and discuss how they help us to make connections, draw contrasts and build a picture of how the Tramway has developed over time.

Examine the mural (bottom station), what historical features can you identify, e.g landscape, clothing, buildings.

Continuity and Change.

Why did the Central Tramway change from coal to electric?

Compare trams and trains from the Victorian period to those we use today.

Look at advertisements, what are they supporting? Do any of them support/advertise the same cause?

Follow up work in school could develop children's understanding of historical, scientific, and technological advancements during and after the Victorian period in Scarborough and Britain.

Cause and Consequence.

Discuss why was the Tramway was built.

During the Second World War is there any evidence that shows that women worked on the tramway?

During the war time years, why do you think it was important to keep the tramway in operation?

This is an area for development that can be explored back in the classroom as follow-up work focusing on social changes that have occurred during and since the Victorian era.

DESIGN AND TECHNOLOGY

Evaluating

What is the function of the Tramway? What other methods might there be for moving up and down an incline. Consider the pros and cons of other options.

What is the purpose of having design work (banners/posters) around the Central Tramway?

Evaluate your own models and posters.

Technical Knowledge

How do the trams move up and down the tracks? Has this changed since Victorian times?

Are the trams still designed and built in a similar fashion today? Explain your answer.

What important pieces of technology do you think help the carriages move up and down the tracks?

Design and Make

Design and make your own simple Tramway pulley system.

Design your own poster to promote the Central Tramway.

SCARBOROUGH - A BRIEF TRAM RIDE THROUGH TIME (FOR TEACHERS)

Scarborough has become one of the most popular seaside towns in Britain and was the country's first seaside resort.

It is believed that humans first settled in the area some 2,500 years ago during what is known as the Iron Age. The Romans followed these first settlers and built a signal station (still visible today) where the Castle grounds are now situated. These early colonisers brought with them the knowledge and skills that ultimately transformed the settlement's size and layout.



Reconstruction drawing by Alan Sorrell of the Roman signal station at Scarborough Castle (© English Heritage)

Although there is no surviving archaeological evidence of Vikings settling in Scarborough, we have a theory, thanks to fragmented documentary sources, that a settlement was burnt down during the Norman invasion led by Harald Hardrada in 1066.

It is during the Medieval period (around 800 years ago) that Scarborough became the thriving coastal town we know of today. The Castle, which sits atop the cliff and dominates much of the skyline above the town, was built in the 12th Century replacing a tower from the 4th Century.

It was under Henry II that the town was developed and expanded. Building on the ideas of the Romans, Scarborough was built in a series of grids, the street patterns are visible in aerial photographs today.

The town continued to grow right up until the 15th Century. Scarborough's first real taste of the tourist industry began in the 1600s, when acidic water with potential healing properties was discovered. However, the next stage of major development and expansion was not seen in Scarborough until the 1700s. The healing waters attracted wealthy people from all over the country and Scarborough became a Spa Town, as well as popular resort for entertainment.

During this time Scarborough became a major port. It was the centre for bringing in large amounts of coal and many luxury items from abroad that were highly sought after by the wealthiest visitors staying in the area.



Picture from 1735 depicting Scarborough and the original 'Spaw' buildings in the bottom left by Thomas Gent (illustrations may not be by Gent) - History of Hull (Annales Regioduni Hullini) [1735], 1869 reprint.

In the 1800s the Spa complex was built as growing numbers were visiting the coast to take the air and sample the spa water. In order to open-up access to and from the Valley, the Spa Bridge was constructed and opened in 1827, you can still see this today.

Prior to the 19th Century, people travelled to the town via horse and carriage as there were no other access points the town. But, the coming of the railway in 1845 changed Scarborough drastically, and arguably fixed its position on the map as one of the main coastal destinations to visit. The railway created the opportunity for day trips, allowing the less wealthy to visit the coast.

Visitor numbers slowly grew. Several prominent buildings, and purpose-built hotels were built to accommodate all these new visitors, including the enormous Grand Hotel which was completed in 1867. More houses were built to accommodate Scarborough's growing population and the stream of wealthy holiday makers.



Old picture of the Grand Hotel from the Library of Congress Archive, USA



Original photograph of the Scarborough Aquarium from the Scarborough Museums Trust Collection

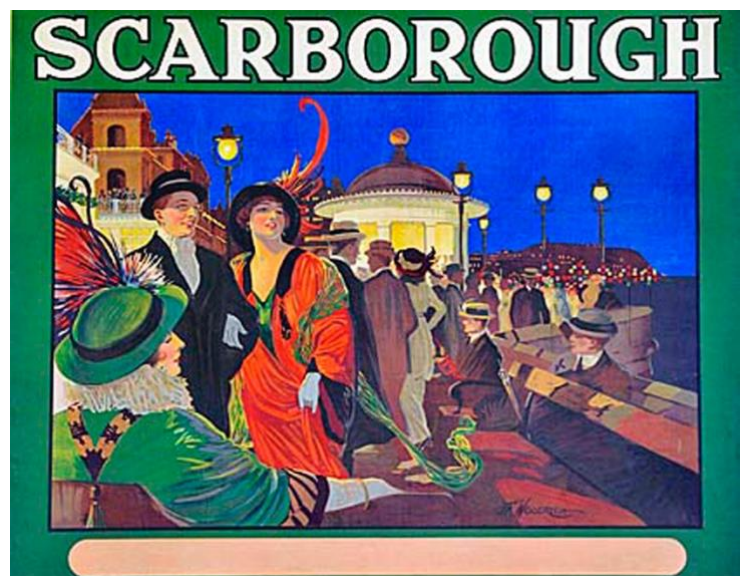
Entertainment was a booming industry during the Victorian and Edwardian periods, and across the town several establishments were created for such a purpose, places such as the Rotunda Museum, the Aquarium, the Theatre Royal.



Original postcard of Peasholm Park

Gardens were also a popular choice of venue to frequent, including Peasholm Park on the North Bay, opened in 1912.

Into the 20th and 21st Centuries, Scarborough has remained a vibrant seaside resort. It has seen industries come and go and has attracted theatre and musical stars alike. The population has increased dramatically since the 1800s, from 13,000 in 1851, to almost 108,000 today. The town has expanded exponentially to accommodate this huge increase.



Original tourist poster from the Scarborough Museums Trust Collection

SCARBOROUGH'S MARVELLOUS MACHINES

Did you know Scarborough had 5 cliff railways at one time? As the first seaside resort in the country visitors came for the sea, the Spa and the entertainment all located down the cliff from the hotels and accomodation. Cliff railways were a quick and convenient way for visitors to get to the fun of the attractions at the seafront.

FUNICULAR LIFTS IN SCARBOROUGH

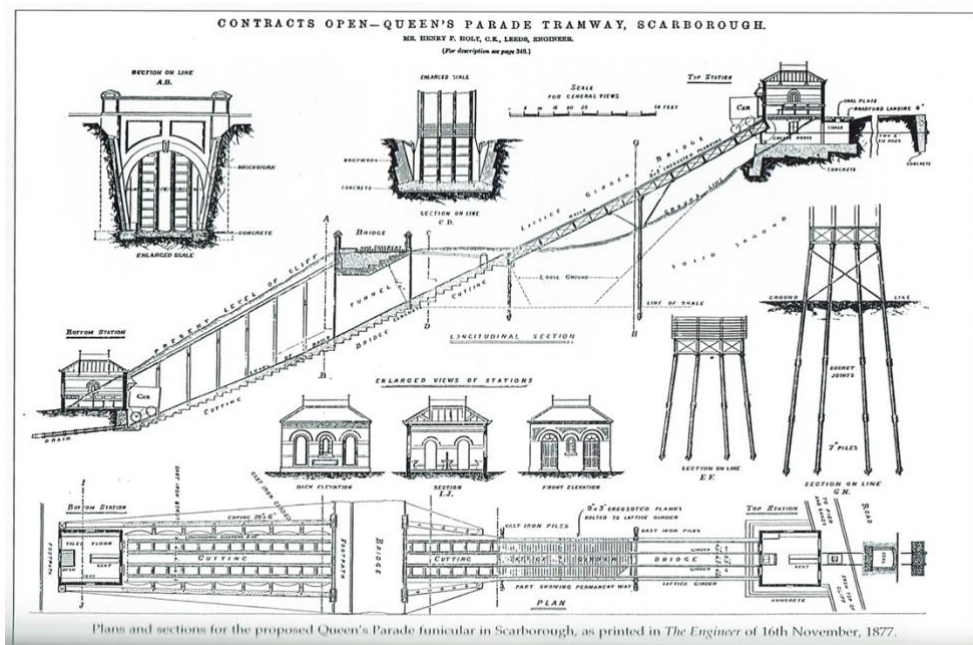
The first funicular tramway ever to be built in Scarborough, and in fact the UK, was the **South Cliff Lift**, which opened in 1875. Originally the lift was powered by a water balance system. Sea water was pumped to the top station to fill tanks underneath each carriage.

Still in operation today, it connects the South Cliff Esplanade with the beach of the South Bay and is powered by electricity. Just 3 years later another lift was built on the North Bay to transport people to the North Bay Pier and attractions. **The Queen's Parade Cliff Lift** was opened in 1878. Powered by the same water balance system, the lift connected the cliff top, at Queen's Parade, with the pier and beach below.

Sadly, this lift was not in operation for long. On its opening day a serious accident damaged one of the carriages. It reopened a few months later but the ground proved to be unstable and a landslide in 1887 forced the Queen's Parade Tramway to close permanently.

What is a funicular lift?

A funicular lift is a type of passenger vehicle that uses cables or ropes to move 2 carriages up and down a slope. The cable is connected to both carriages and loops over a pulley wheel at the top of the track (see diagram on page 17). They move at the same time, so as one goes up the slope, the other will come down.



Original plans for the Queen's Parade Tramway from *The Engineer* 1877.

The **Central Tramway Company Scarborough Limited** opened in August 1881 next to the Grand Hotel and is now the oldest tramway company in the country as it still operates under the original corporation that was formed in 1881.



Early photograph of the Central Tramway Company from the collection of Funimag

Originally the lift was steam powered and was the only steam operated funicular in the country.

In 1920 the lift was converted to electricity, connecting to the electricity supply for the road tram system that opened in 1904.

Two more cliff railways opened in the 20th century in Scarborough on the North and South Bays. The **St Nicholas Cliff Lift**, was opened to the South of the Grand Hotel in 1929. It closed in 2017 and now functions as a café with the trams locked in a stationary position at the top of the cliff. The **North Cliff Lift** operated for a period of 66 years from 1930-1996, before being demolished.

Different names for the cliff railways:

- CLIFF LIFT
- FUNICULAR
- TRAMWAY
- CABLE RAILWAY

Did you know the word funicular comes from the Latin word 'funiculus' the diminutive of funis, which translates as "rope"?

Scarborough's Cliff Lifts at a glance.

1875 – today: Spa Cliff Lift

1878-1887: Queen's Parade Tramway

1881 – today: Central Tramway Company

1929-2007: St Nicholas Cliff Lift

1930-1996: North Cliff Lift

THE CENTRAL TRAMWAY COMPANY

The Central Tramway Company was funded by a group of local investors who were hoping to profit from the success of Scarborough's newest cliff railway. They each bought shares in the business worth £5 each. £10,000 worth of shares were bought, which is equivalent to about £1million today.

The first Chairman of the company was John Woodall Woodall. He was well known throughout Scarborough as he had been the towns' Mayor four times. The Town Hall, opposite to the Central Tramway Company, was once the family home of John Woodall Woodall.

The building of the cliff railway took just six months. Each track is 71m long and 143.5cm wide.

In 1920 the steam operation was changed to electric power with a further upgrade in 1932. The tramway has had several further upgrades since including recent updates to its operating systems.



Can you find this plaque outside the top station?



Painting of John Woodall Woodall from the Scarborough Museums Trust collection

FUN FACT

The original fare in 1881 was 1 old penny which is equivalent to 1/2p in today's money.



Before the refurbishment of 2012



After the refurbishment of 2012

HOW THE TRAMWAY WORKS

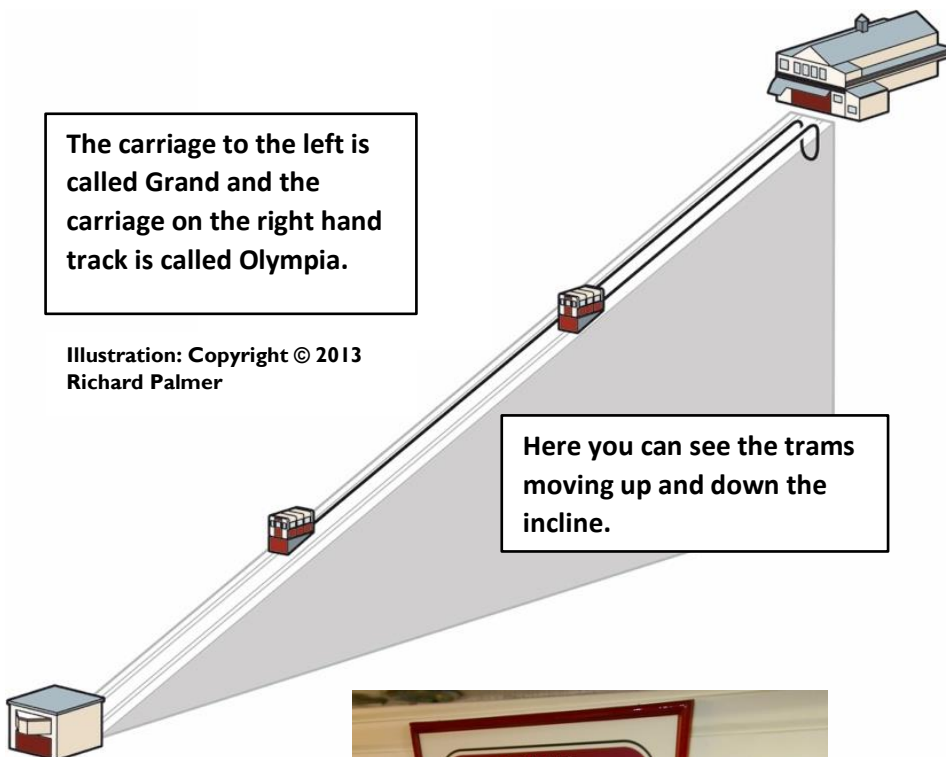
The two tram cars are linked by steel cables. As one goes up the other goes down. This is what we call the counter-balance principle.

The process is very environmentally friendly – it uses less energy – because the weight of the tram going down pulls the other tram up. The force that plays a big part in the movement of the trams is **gravity**. The Tramway is now powered by electricity (assisted by gravity) but was originally powered by coal. However, this became very expensive and in the light of electricity the decision was taken to convert the power system.

The carriage to the left is called Grand and the carriage on the right hand track is called Olympia.

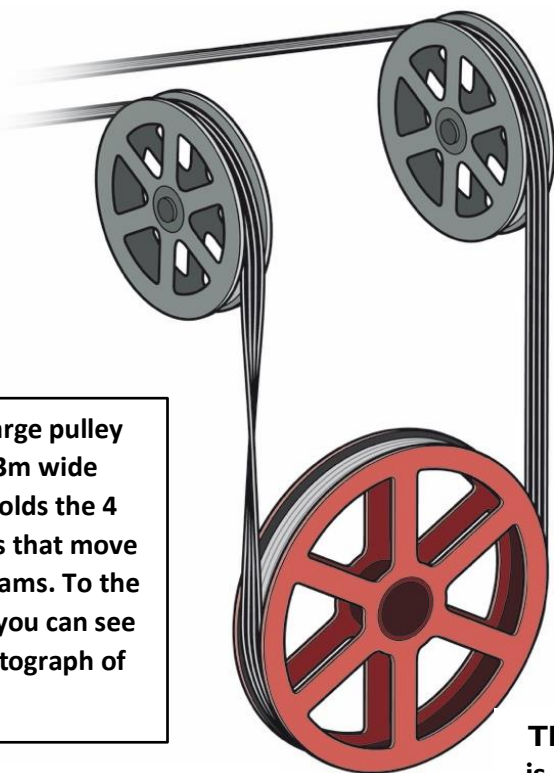
Illustration: Copyright © 2013
Richard Palmer

Here you can see the trams moving up and down the incline.



The large pulley is 2.13m wide and holds the 4 cables that move the trams. To the right you can see a photograph of it.

Illustration: Copyright © 2013
Richard Palmer

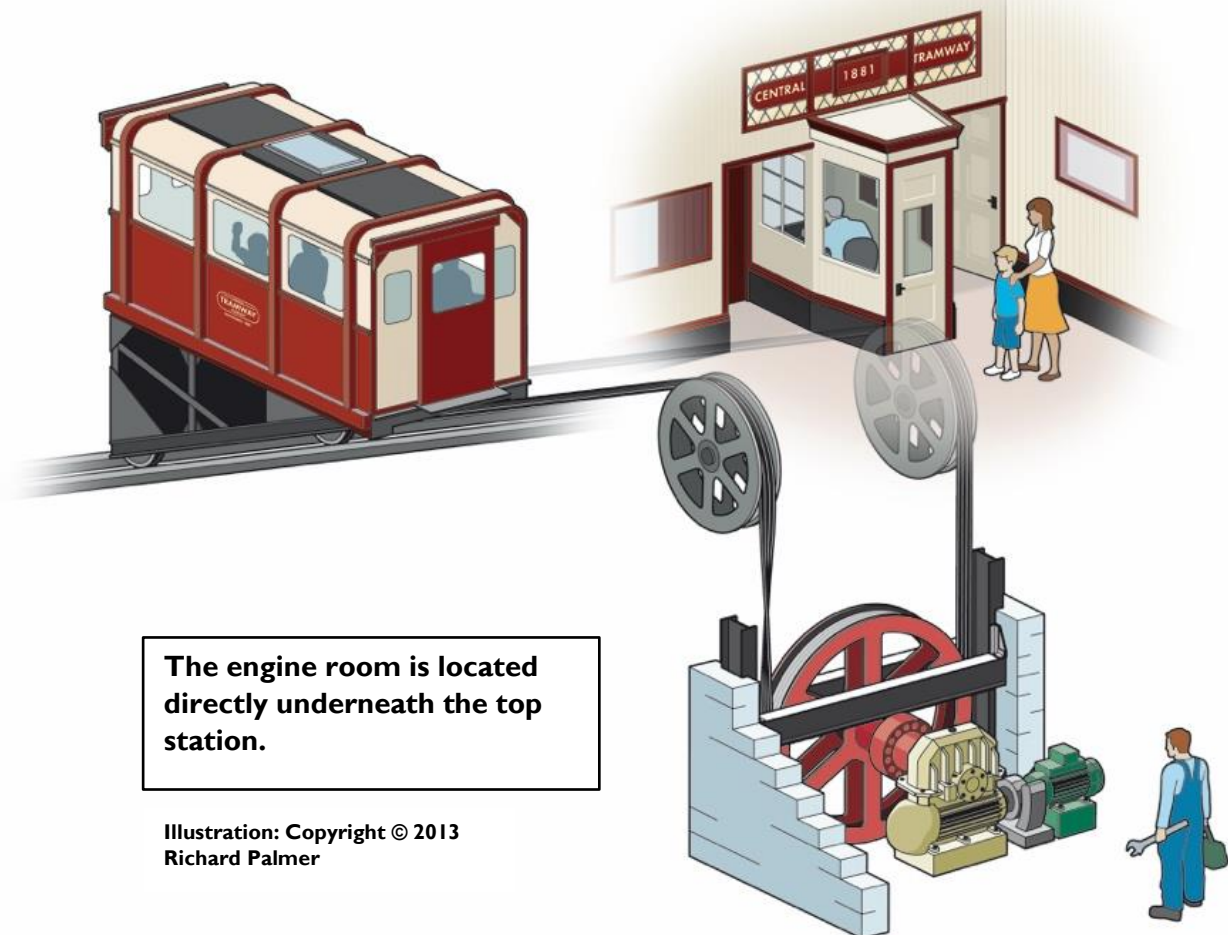


The pulley, gear box, motor and disk brake. There is a video of the movement available to view in the online resource folder.

An electric motor, the equivalent of 60 horses (60 horsepower) powers a large pulley. There are four ropes that are attached to each tram and that go around the pulley. Each rope has 250 individual wires in its construction. The ropes that are attached to each tram are connected to this pulley as well. As the pulley goes around, the attached ropes tighten, and the trams start to move. More forces are acting here are **tension** and **friction**.

There is an electronic control system in the Engine Room which is used to slow and stop the trams. This control system receives signals from the track alerting them that the tram cars are approaching the stations. It then reduces the amount of electricity driving the big pulley which in turn slows and stops the trams. Once the tram cars are in the stations a parking brake is applied so that they cannot move out of the stations, until the driver starts the process of moving the tram cars again.

The driver sits in the cabin at the top station and operates the Tramway with a buttons on a control panel.



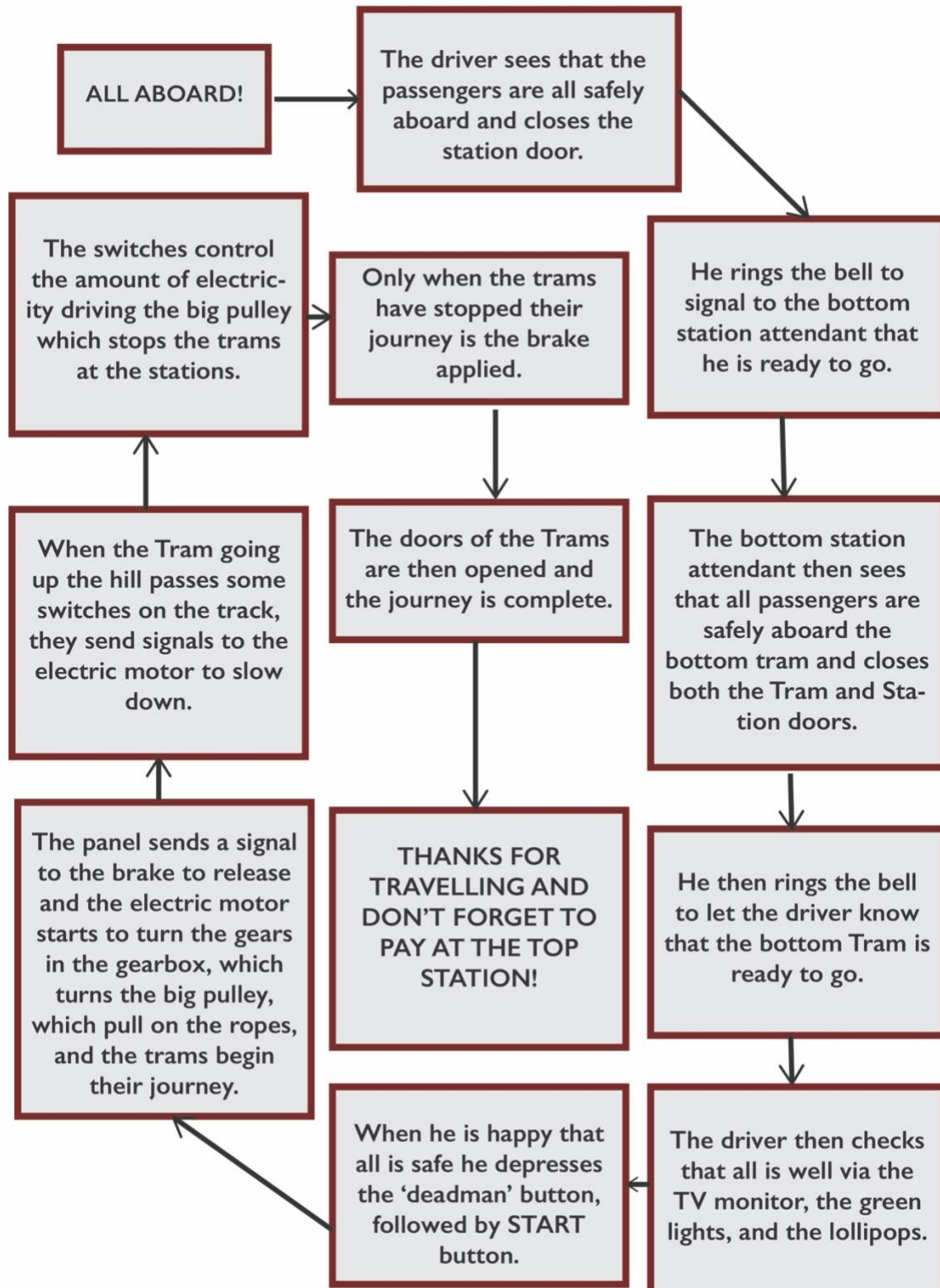
The engine room is located directly underneath the top station.

Illustration: Copyright © 2013
Richard Palmer

You will be provided with a more detailed poster of how the Tramway works on your visit to take back to the classroom. Illustrations by Richard Palmer

CHECKS AND PROCEDURES

At Central Tramway we have very rigorous safety procedures to make sure our passengers and team are safe at all times. This diagram describes some of the procedures that happen every time the carriages move up and down the track.



WORKSHEETS

In this section we have devised a series of questions that can be used as part of your visit or as a follow up activity. More information can be found on our website or Wikipedia page.

GENERAL QUESTIONS

In what year did the Central Tramway Company open?

How many years has the Central Tramway Company been in operation?

What historical period did the Central Tramway Company open?

What is the name of the first Chairman of the company?

What type of location is the Central Tramway located in? Urban, rural, coastal? Explain your answer.

What are the transport methods chosen by visitors when coming to visit the Central Tramway?

Why do you think the Central Tramway has more visitors during the months April to September?

During the war time years, why do you think it was important to keep the tramway in operation?

Compare differences between in fashion from the Victorian period to that of today.

Compare trams and trains from the Victorian period to this we use today.

Looking at images from the log book, do you think the number of visitors would have changed during times of war?

What are the names of the two local architects who inspired the refurbishment?

PRE-VISIT QUESTIONS

Where is the Tramway?

Have you been before?

How did you get there?

Have you been on a funicular before? In the UK? Anywhere else in the world?

Estimate the number of people who will travel on the tramway every day? (Think about seasons and holidays – will these factors affect your number?)

Estimate how many children you think will be able to fit in the carriage. Now estimate how many adults.

Before your tram ride, estimate how long it would take a carriage to reach the top/bottom.

Terminology: It would be useful if you discuss these terms before your visit. Heritage. Funicular. Gauge. Gradient. Corrosion. Tension. Gravity. Friction.

QUESTIONS TO ASK WHEN RIDING THE TRAM

What are the Central Tramway carriages made from?

How do the trams move up and down the tracks?

What important pieces of technology do you think help the carriages move up and down the tracks?

Identify and understand the different forces that are used in powering the trams.

(Scientific terminology – gravity, push and pull, friction, tension)

How long is the track?

Are the trams still designed and built in a similar fashion today? Explain your answer.

How many people can safely ride in the tram?

How many people are in your tram?

With two full trams, how many people are riding altogether?

Why do you think the tram carriages are shaped like they are?

Using your hand span, how wide are the windows of the tram carriage?

Record the number of adults/children/pets to travel in one carriage on one journey.

How often are the wire ropes replaced?

Which factor causes the most corrosion/wear and tear to the ropes? Weather or number of tram rides?

Give reasons for your answer.

What are the benefits/disadvantages of using wood and canvas or metal? Think about how often you would have to replace materials.

How much can each tram weigh when full?

The change from coal to electric – Why do you think the Central Tramway Company made this change?

What does gauge mean?

What does gradient mean?

How long are the tracks?

Which local company provided two new carriages in 1932?

What is the terrain like around the Tramway?

THINGS TO LOOK FOR ON YOUR VISIT:

Blue plaque

Driver

Cables

Clock

Rowntrees advert

QUESTIONS TO ASK WHEN AT/IN THE STATIONS

Examine the mural (bottom station), what historical features can you identify, e.g. landscape, clothing, buildings.

What is the purpose of having design work (banners/posters) around the Central Tramway?

What do you think the cart in the top station was used for?

Look at the buildings (top and bottom stations), what features can you identify that show different periods in time? (Look at the decorations and materials).

Using the old photographs at the stations, can you identify any differences from the station we see today?

Compare the ticket system used in the past to that used today.

Using your feet, measure the length/width of the station (inside).

How many different shapes can you identify in the top and bottom stations? (Outside)

Talk to the station operator, ask them about 3 tasks they do each day and write them down.

What can you see around the Central Tramway? What do think the stations would have been like during the Victorian period?

Look at advertisements, what are they supporting? Do any of them support/advertise the same cause?

What two disasters affected the Tramway in 1975 and 1976?

Angles – look at the incline/decline of the track.

What type of angle is produced when you draw the track and the ground and connect the two?

OBSERVATIONAL DRAWINGS

Make detailed sketches of the following:

Carriages

Cart (top station)

Design a ticket to ride the tramway.

Draw and label some of the features you have identified on the building.