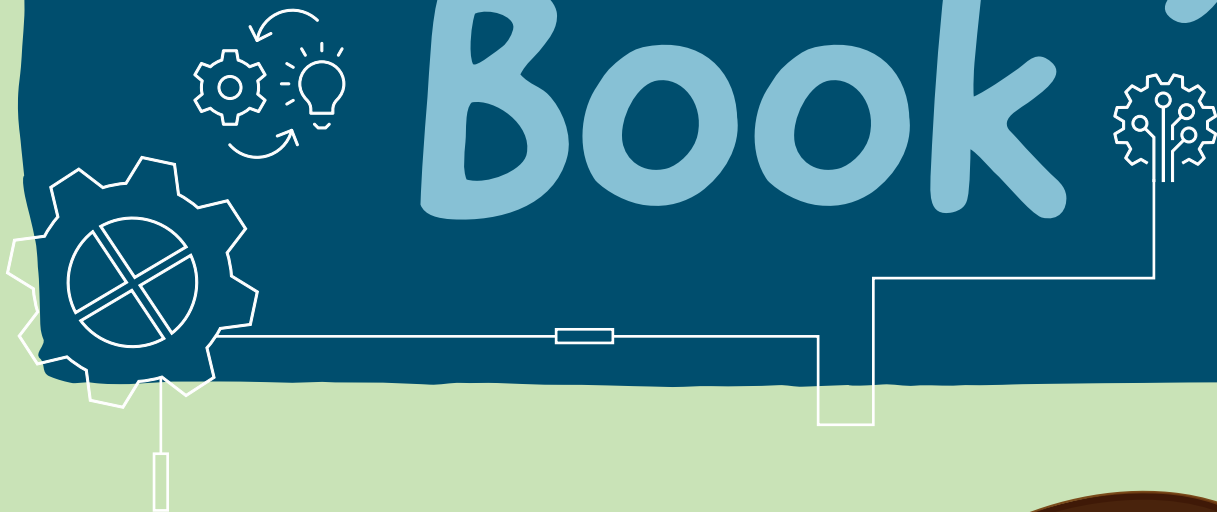
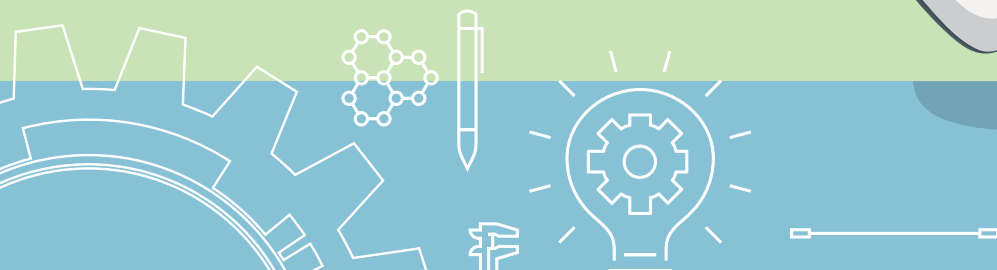


# Activity Book



Join Emily the  
engineer on a  
rail adventure

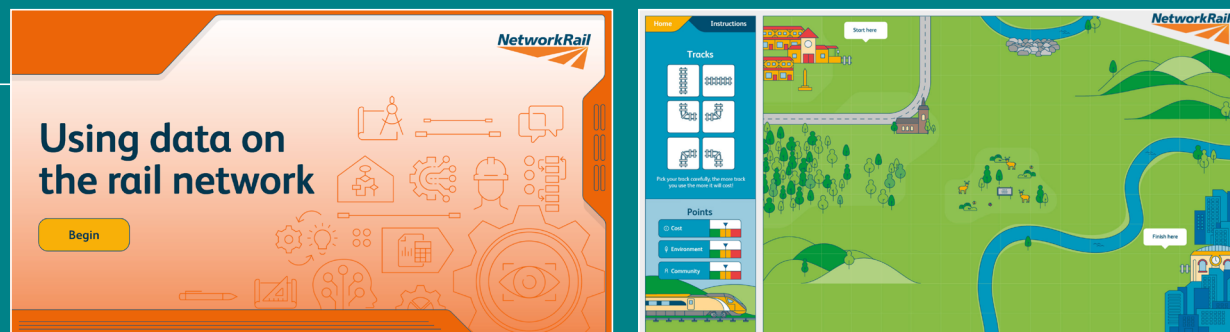


# Educational resources

We think trains and railways are awesome, and that's why we need young people at school today to learn about science, technology, engineering and maths – so that you can help us to invent and design the railways of the future.

We're always eager to tell young people about all the exciting learning opportunities the railway has to offer. Here are some useful materials to help you explore...

Hi, I'm Emily and I'm an engineer on the railway. In this activity book, we are going to go on a rail adventure to learn about engineering. Here are some snippets from some of our games available – head to our website to take part in some fun activities to keep you busy whilst you are at home: [www.networkrail.co.uk/stories/educational-resources-for-children](http://www.networkrail.co.uk/stories/educational-resources-for-children)  
Thanks, Emily



# Colouring

Help bring the picture to life by colouring in the train as it leaves the station



**YOUNG RAIL**  
PROFESSIONALS



**RAILWEEK**

Rail Week celebrates the diverse and rewarding career opportunities available across the rail sector. The dedicated week of activity aims to address the skills shortage in rail-related roles and inspire a generation of young people through a series of virtual events, visits and talks.

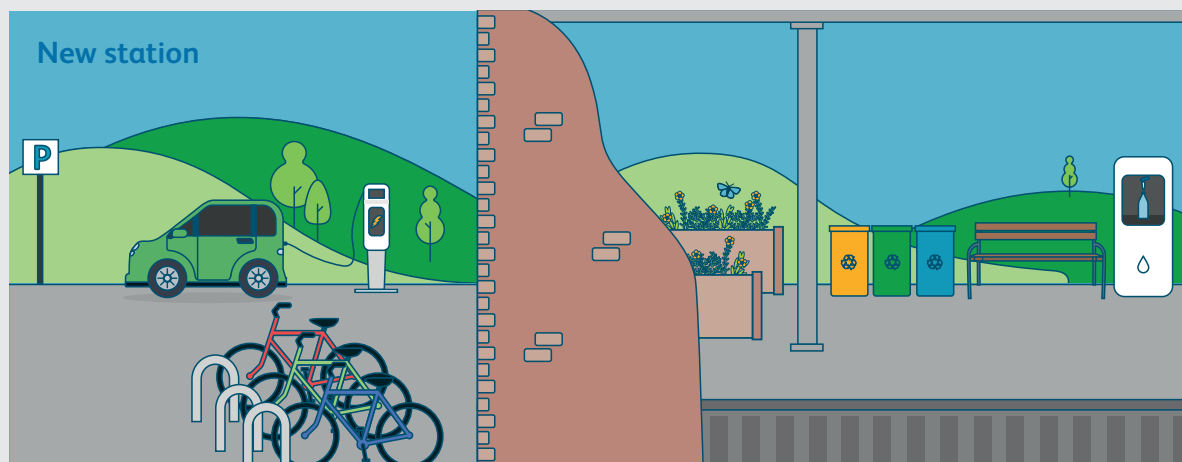
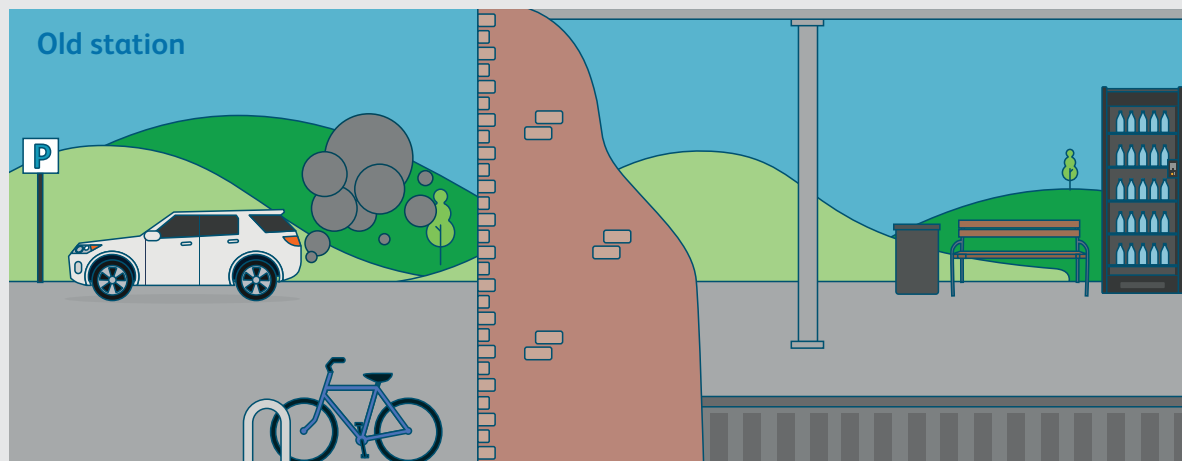
Find out more at <https://www.youngrailpro.com/page/about-yrp>



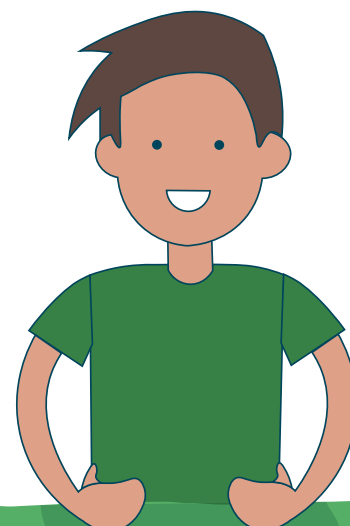
# Spot the difference

By making small changes to everyday places like our stations, we can encourage people to be tidy and save energy – looking after the environment.

Can you spot how many ways we have changed this station?



Hi I'm Elliot the Environmentalist. I work with Emily and other workers on the railway to make sure we look after the environment properly.



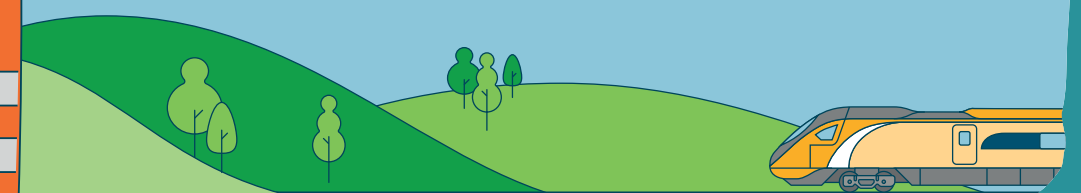
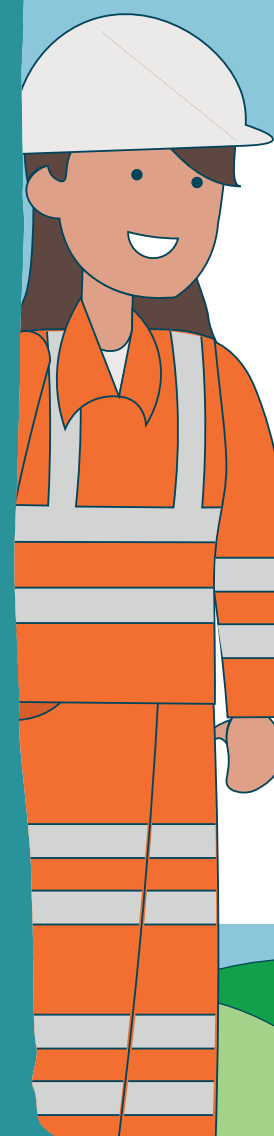
# Word search

Our railway lines pass woods and forests, embankments and people's gardens, and you will see many different trees from your train window.

Can you find them all hidden in the word search below?

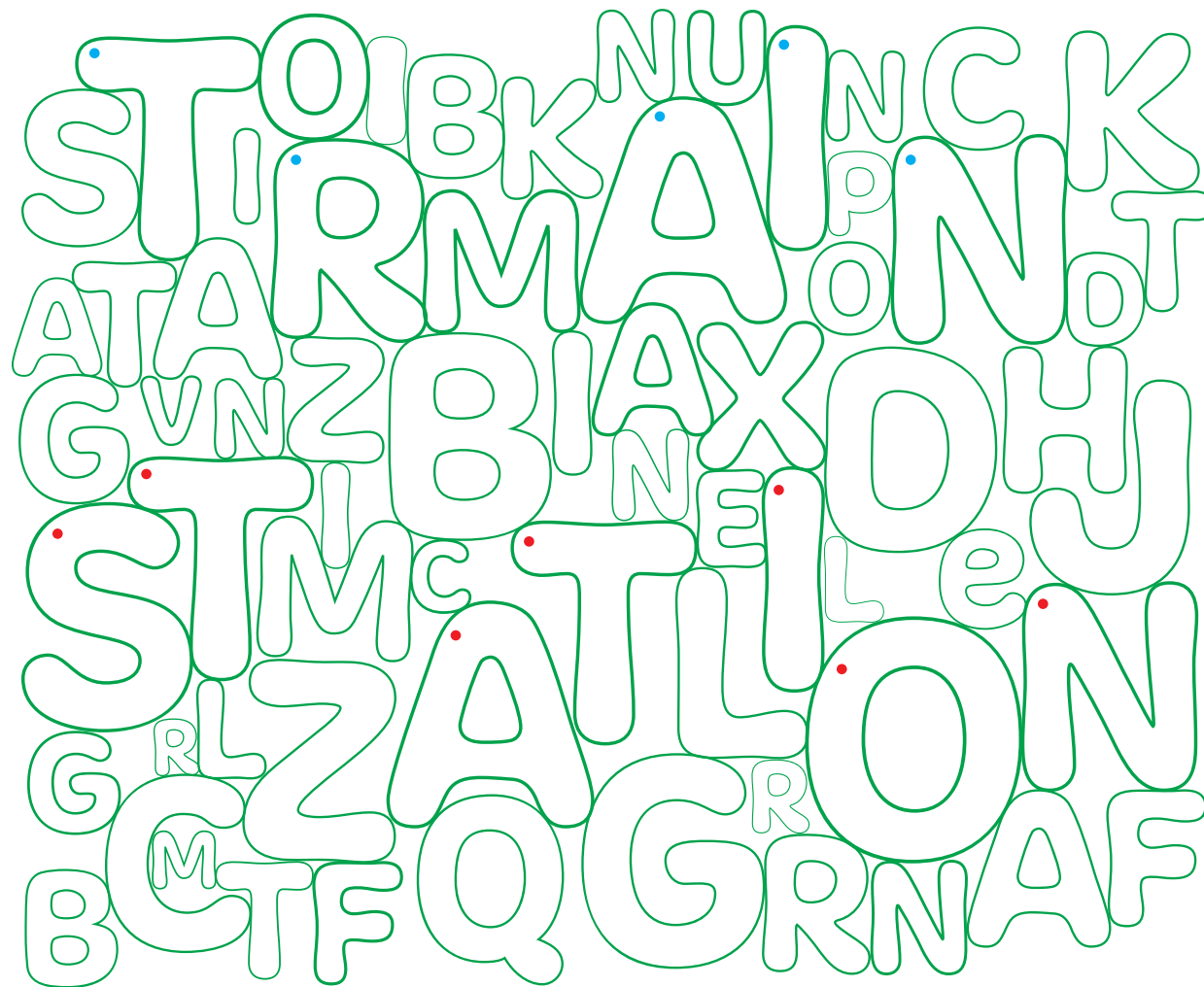
YEW SCOTS PINE OAK  
BIRCH HOLLY ASH  
SYCAMORE HAZEL  
POPLAR ELDER

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



## What does it say

Colour the letters the same colours as the dot they have, to reveal a message.



Question: How many people do Network Rail employ?

Answer: 40,000 people – enough to fill Chelsea's Stamford Bridge stadium!



## Map maze



### Maze

Can you find your way around these routes?

1. London – Penzance
2. London – Swansea
3. London – Norwich
4. London – Manchester
5. Manchester – Glasgow
6. Glasgow – Edinburgh
7. Edinburgh – London



An intercity train travels at up to 125mph and weighs 400 tonnes – when it brakes, it will travel the length of 20 football pitches before it stops



# Timetables

At Network Rail, we work round the clock to keep our trains running safely and reliably.

Use the train timetable to answer the following questions.

1.

If you arrive at Manchester Station at 3:00 pm, which train can you buy a ticket for?

.....

2.

How long does Train A take to get from Manchester to London?

.....

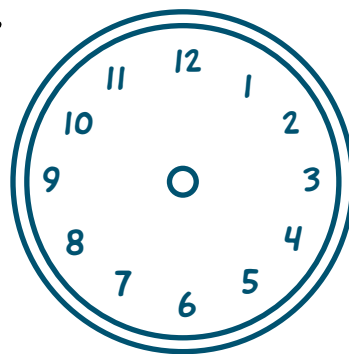
3.

If Train B stops at 5 stations along the journey, for 2 minutes each time, how many minutes is the train sat still for?

.....

4.

Draw the hands onto this clock to show what time you would arrive in London if you took Train C.

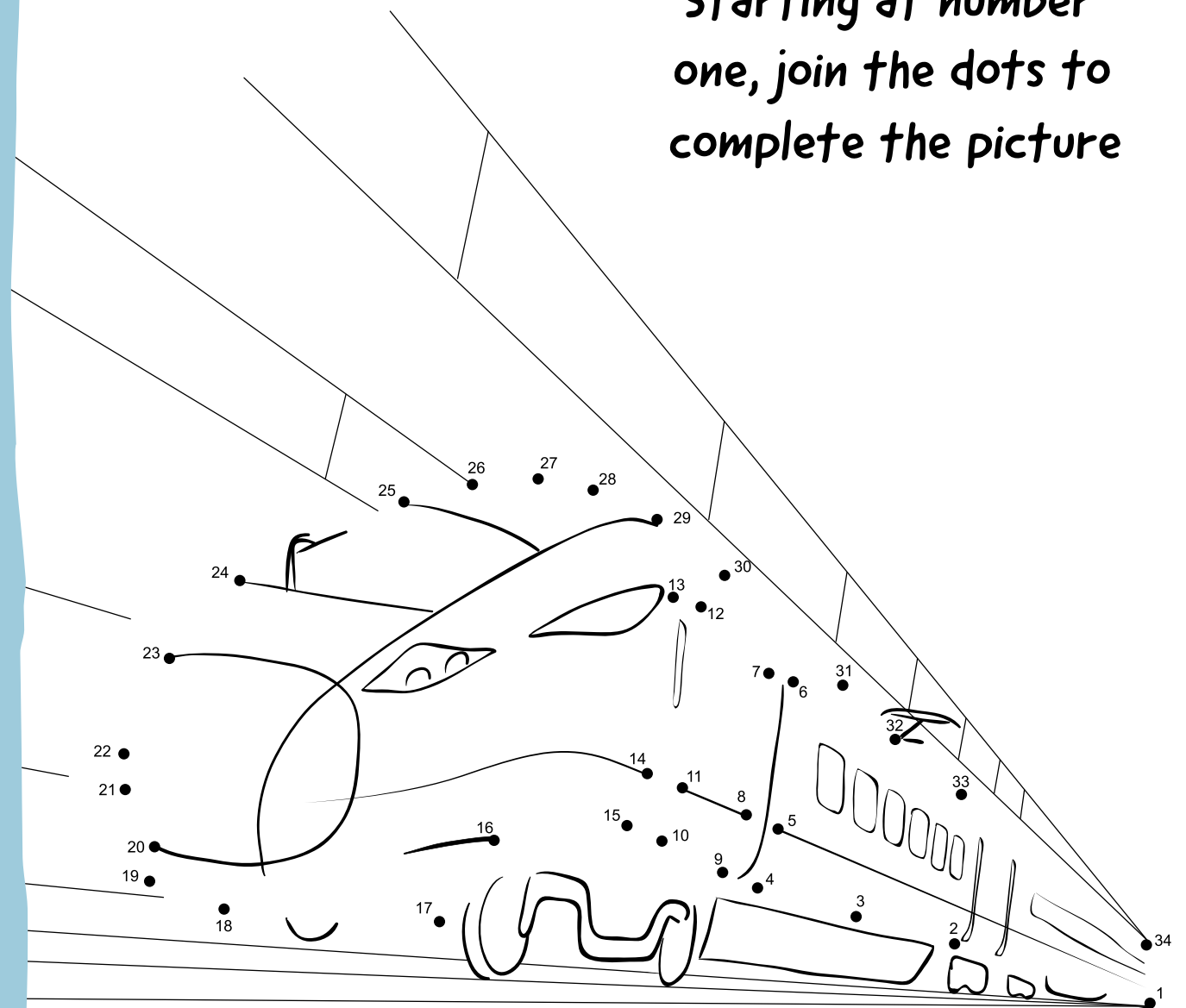


## Manchester to London Timetable

	Depart	Arrive
Train A	9:00 am	11:00 am
Train B	1:00 pm	3:30 pm
Train C	4:00 pm	7:00 pm

# Join the dots

Starting at number one, join the dots to complete the picture



Question: There are around 6.3 million trees growing beside the tracks. Tree leaves on the line can make the tracks dangerous.' How do you think we keep the tracks safe?

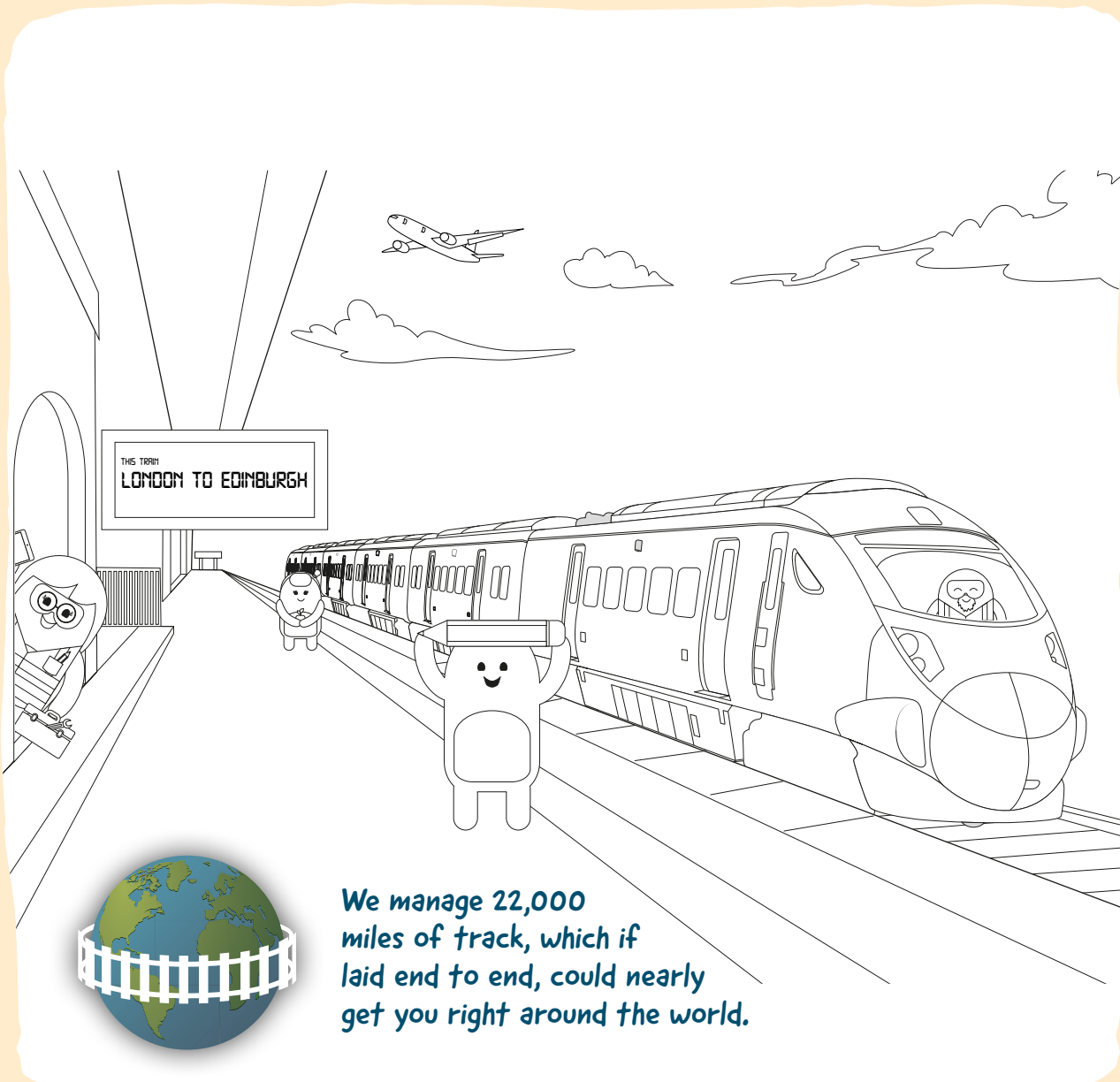
Answer: More trains! We have over 50 leaf-busting treatment trains that clean the rails using water jets and then apply a sand-based gel to them to help trains grip the rails.

# Colouring in

The Hitachi Rail team have decided to visit the famous Edinburgh Castle – the home of many kings and queens since the 12th century!

**HITACHI**  
Inspire the Next

Help them get on their way by colouring in the train and station so the team can start their adventure.









We manage 22,000 miles of track, which if laid end to end, could nearly get you right around the world.

# Maths

Safety equipment is very important in keeping workers safe on the railway. Can you do some maths to work out what the hard hat, safety glasses and hi-visibility jacket are?













1.  +  +  +  = 16       = .....

2.  +  +  +  +  = 10       = .....

3.  +  +  = 21       = .....

4.  +  +  = .....

5.  +  +  +  = .....

6.  +  +  +  +  +  = .....

7.  +  +  +  = 17       = .....



# What type of Rail Engineer am I?

Can you match the description to the correct engineer?

1.

I understand and look after the software to control the signalling system, the ticketing system and the train information systems. I am a...

- ☐ A. Software engineer  
☐ B. Civil engineer  
☐ C. Electrical engineer  
☐ D. Mechanical engineer

2.

I understand and look after the electric motors, controls, radios and electric power. I am a...

- ☐ A. Software engineer ☐ C. Electrical engineer  
☐ B. Civil engineer ☐ D. Mechanical engineer

3.

I understand and look after the wheels, doors, and coaches of the trains. I am a...

- ☐ A. Software engineer ☐ C. Electrical engineer  
☐ B. Civil engineer ☐ D. Mechanical engineer

4.

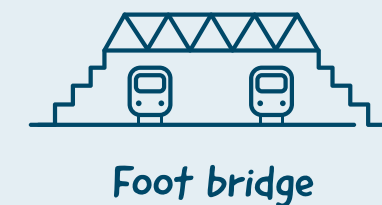
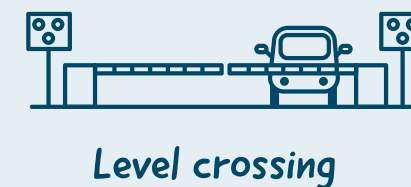
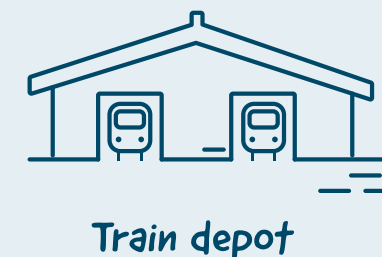
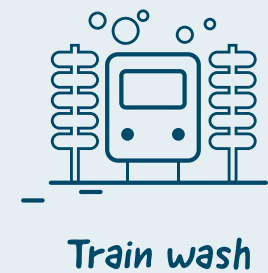
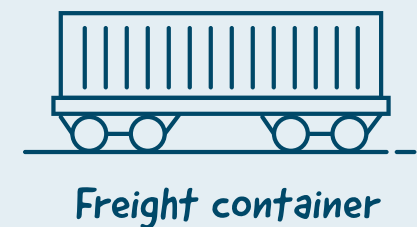
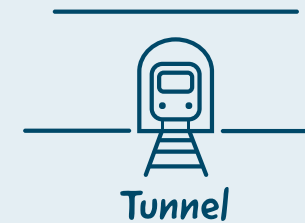
I understand and look after the tracks, bridges and tunnels. I am a...

- ☐ A. Software engineer ☐ C. Electrical engineer  
☐ B. Civil engineer ☐ D. Mechanical engineer



## I spy

When you travel on the train today, circle all of the things you see out of the window!



Can you spot anything else?

1. .... 3. ....  
 2. .... 4. ....

# Kriss Kross

We do all we can to make journeys more pleasant and comfortable for the millions of customers visiting our stations.

5 letters

CAFES  
SHOPS

7 letters

SEATING  
SHELTER  
TICKETS  
TOILETS

9 letters

TIMETABLE

10 letters

ASSISTANCE

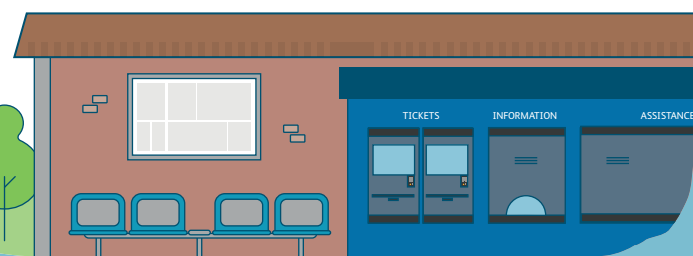
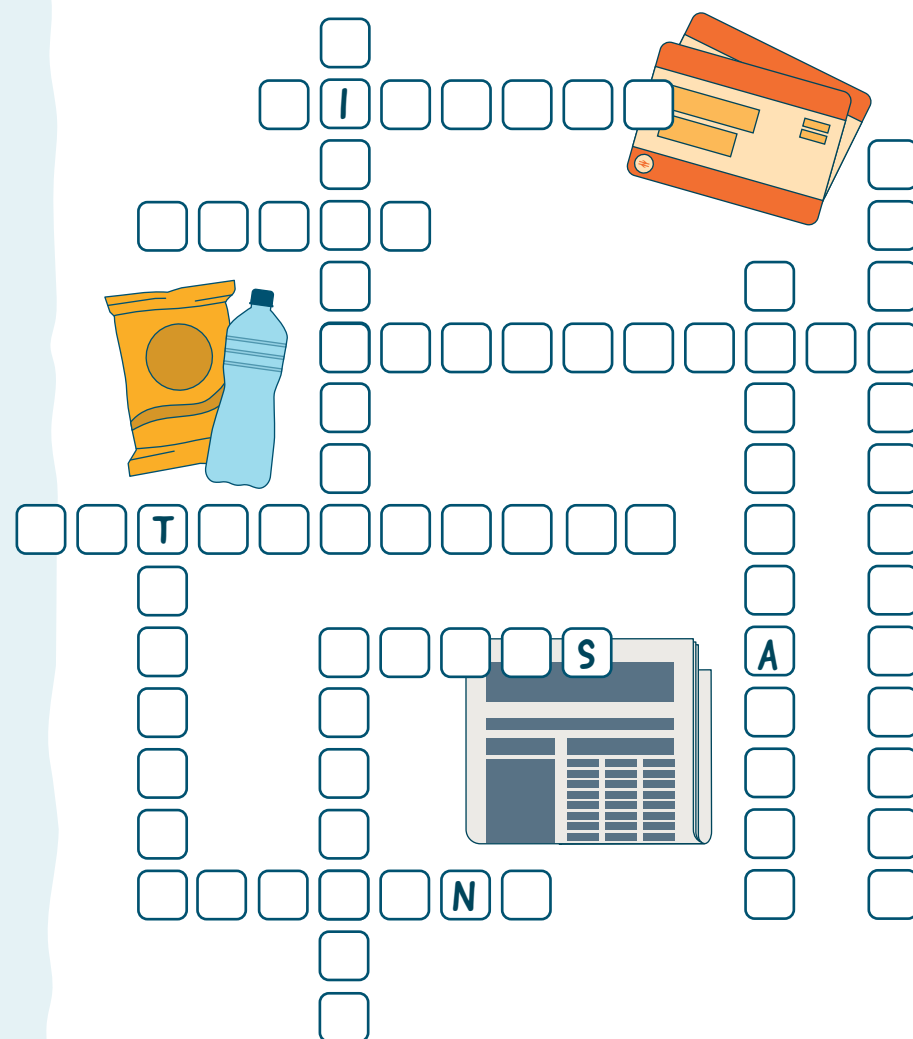
11 letters

INFORMATION  
NOTICEBOARD

13 letters

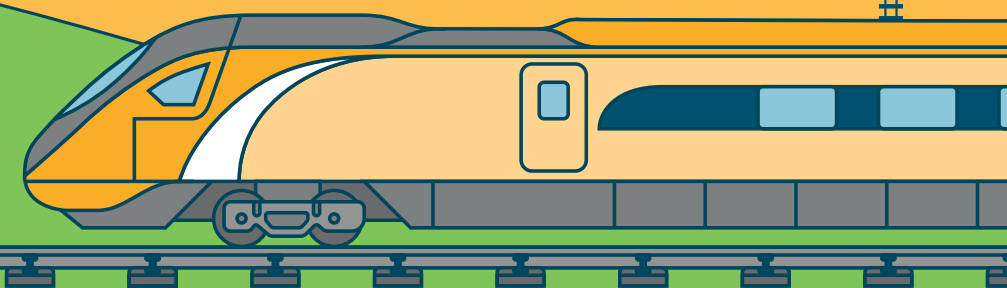
ACCESSIBILITY

Can you work out where each word goes in the grid to complete the puzzle?



# Design a train

Help Emily the engineer design the train of the future. Imagine and draw what your dream train would look like.





# Our partners

This activity book was produced with the kind support of our industry partners:



Network Rail owns, operates and develops Britain's railway infrastructure find out more.

[networkrail.co.uk/stories/educational-resources-for-children](https://networkrail.co.uk/stories/educational-resources-for-children)



NTAR offers a wide range of rail related training ideal for anybody seeking to upskill or for any individuals looking at starting a career in the rail industry.

[ntar.co.uk/our-courses](https://ntar.co.uk/our-courses)



We run a high-speed rail link from England to Europe that runs under the English Channel.

[eurostar.com](https://eurostar.com)



Hitachi Rail is connecting the future of mobility – helping every passenger, customer and community enjoy the benefits of more seamless, sustainable transport. By delivering modern transport and technology Hitachi Rail is helping to cut congestion, unlock economic growth and decarbonising societies around the world, while offering more choice and convenience to passengers and freight operators than ever before.

[hitachirail.com](https://hitachirail.com)



We are the market leader in providing innovative freight solutions. We transport all kinds of items across Britain.

[freightliner.co.uk/careers](https://freightliner.co.uk/careers)



AtkinsRéalis is a world-leading design, engineering and project management organisation. We connect people, data and technology to transform the world's infrastructure and energy systems.

[careers.atkinsrealis.com/uk-early-careers](https://careers.atkinsrealis.com/uk-early-careers)



Amey is a leading provider of full life-cycle engineering, operations and decarbonisation solutions for transport infrastructure and complex facilities.

[www.amey.co.uk/education](https://www.amey.co.uk/education)



 National Rail

We bring together the companies that run Britain's railway into a single team with one goal – to deliver a better railway for you and your community.

[raildeliverygroup.com](https://raildeliverygroup.com)



We are the professional association for those starting careers in the Railway Industry; promoting, inspiring and developing the next generation of railway talent.

[youngrailpro.com](https://youngrailpro.com)



Porterbrook has been at the heart of the UK rail network for over 25 years and owns around a quarter of the national passenger rail fleet.

[porterbrook.co.uk](https://porterbrook.co.uk)



We inspire the next generation of engineers, innovators and thinkers with the past, present and future of railways and engineering.

[railwaymuseum.org.uk](https://railwaymuseum.org.uk)



We build railways and install train signals and overhead lines. We also use large railway machines, that travel all across the country, to remove and replace old units.

[volkerrail.co.uk](https://volkerrail.co.uk)



Alstom is the UK and Ireland's foremost supplier of new and refurbished trains and train services, and a major provider of signalling and rail infrastructure. Employing more than 6,000 people, we design, develop, build and test trains in Derby – the UK's largest train factory and home to Great British Railways. We operate from a further 36 locations including major sites at Crewe, Ilford, Plymouth and Widnes.

[alstom.com](https://alstom.com)



Siemens Mobility has been a leader in transport solutions for more than 160 years and employs 3,500 people in the UK. The organisation delivers trains and rail infrastructure that helps keep the country moving and operates from around 70 UK locations from the south of England to the north of Scotland.

[mobility.siemens.com](https://mobility.siemens.com)



NSAR is a membership organisation and expert skills and workforce consultancy providing services to businesses in the rail, transport and infrastructure sectors.

[nsar.co.uk](https://nsar.co.uk)



Skanska, one of the UK's leading contractors, is an inclusive and responsible business that is helping to build for a better society. Known for major projects, such as the Gherkin and Crossrail, we are building, upgrading and maintaining the country's infrastructure.

[skanska.co.uk](https://skanska.co.uk)



Our engineers work all over the country, using tools and heavy machinery to keep our railways and all the bridges and embankments we travel over, in safe working order.

[www.cml.uk.com](https://www.cml.uk.com)



We police Britain's railways, providing a service to rail operators, their staff and passengers across the country. Our mission is to help the millions of people who use the railways of England, Wales and Scotland get home safely and on time.

[btp.police.uk](https://btp.police.uk)