



# Activity Book

Join Emily the engineer  
on a rail adventure



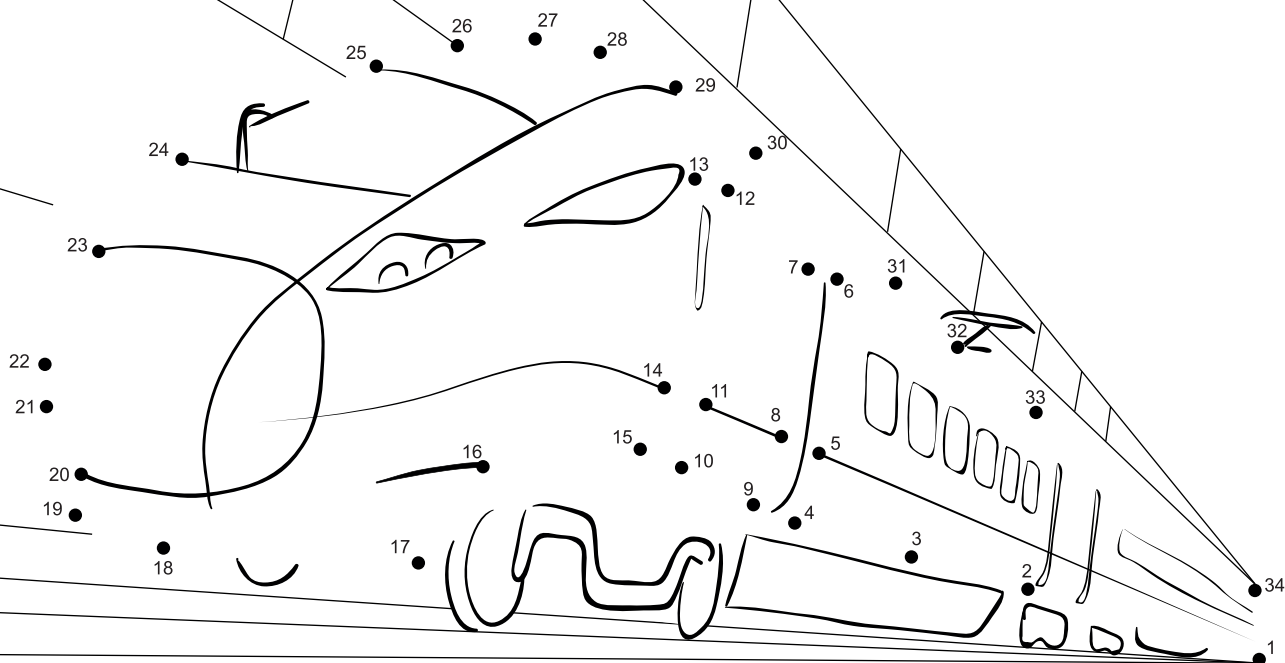
**BRITAIN  
RUNS  
ON RAIL**



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. If you'd like to learn more then go online at: [www.yearofengineering.gov.uk](http://www.yearofengineering.gov.uk)  
Thanks, Emily

## Join the dots

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



**HITACHI**  
Inspire the Next

# Spot the seven differences



These pictures of Emily the engineer look the same but seven things are different. Can you spot them all?  
Draw a circle around each difference you find



1.

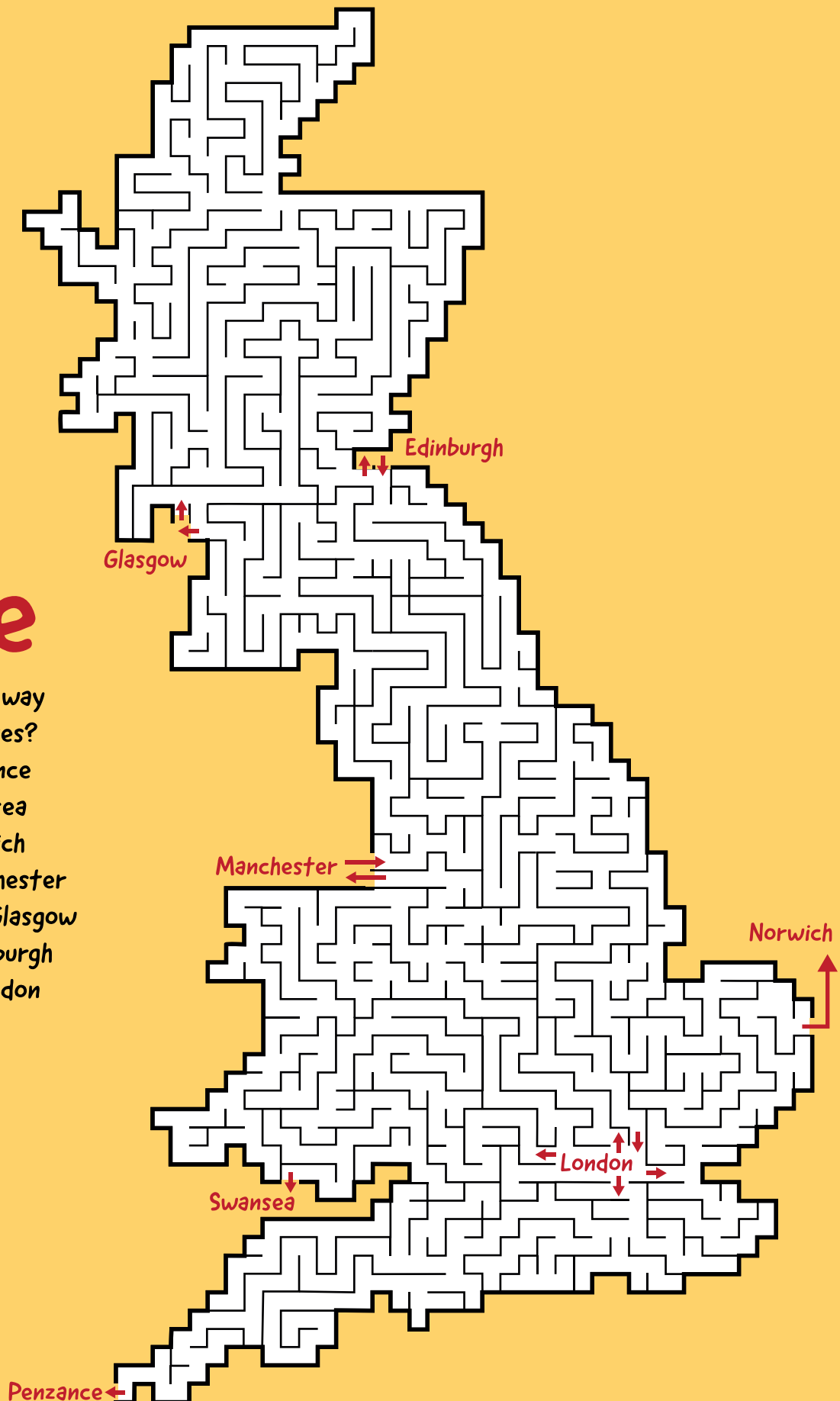


2.

## 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



# What does it say?

Colour the letters that have a dot to read a message. Find out how you can meet a real life engineer, or even become an engineer for a day, with the Year of Engineering's Holiday Makers summer challenge and win some fabulous prizes:  
[www.yearofengineering.gov.uk/theholidaymakers](http://www.yearofengineering.gov.uk/theholidaymakers)



# Wordsearch



Search across and down for the words listed below. To help you understand what the words mean, we have added an explanation for each

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

## Rail items

**CAB:** Where the driver sits at the front of a locomotive train

**SLEEPER:** Made of concrete or wood a sleeper keeps the train tracks upright

**PANTOGRAPH:** An item on the roof of an electric train that collects power from an electric wire above the train

**BOGIE:** A metal structure that is underneath the train carriage that connects the wheels to the train

**GAUGE:** The distance between two tracks

**SIGNAL:** Railway traffic light

## Types of rail engineers

**ELECTRICAL:** Understands and looks after the electric motors, controls, radios and electric power

**MECHANICAL:** Understands and looks after the wheels, doors, coaches and the couplers that link them together

**CIVIL:** Understands and looks after the tracks, bridges and tunnels

**SOFTWARE:** Understands and looks after the software to control the train signalling system, the software to control the ticketing system, and the train information systems



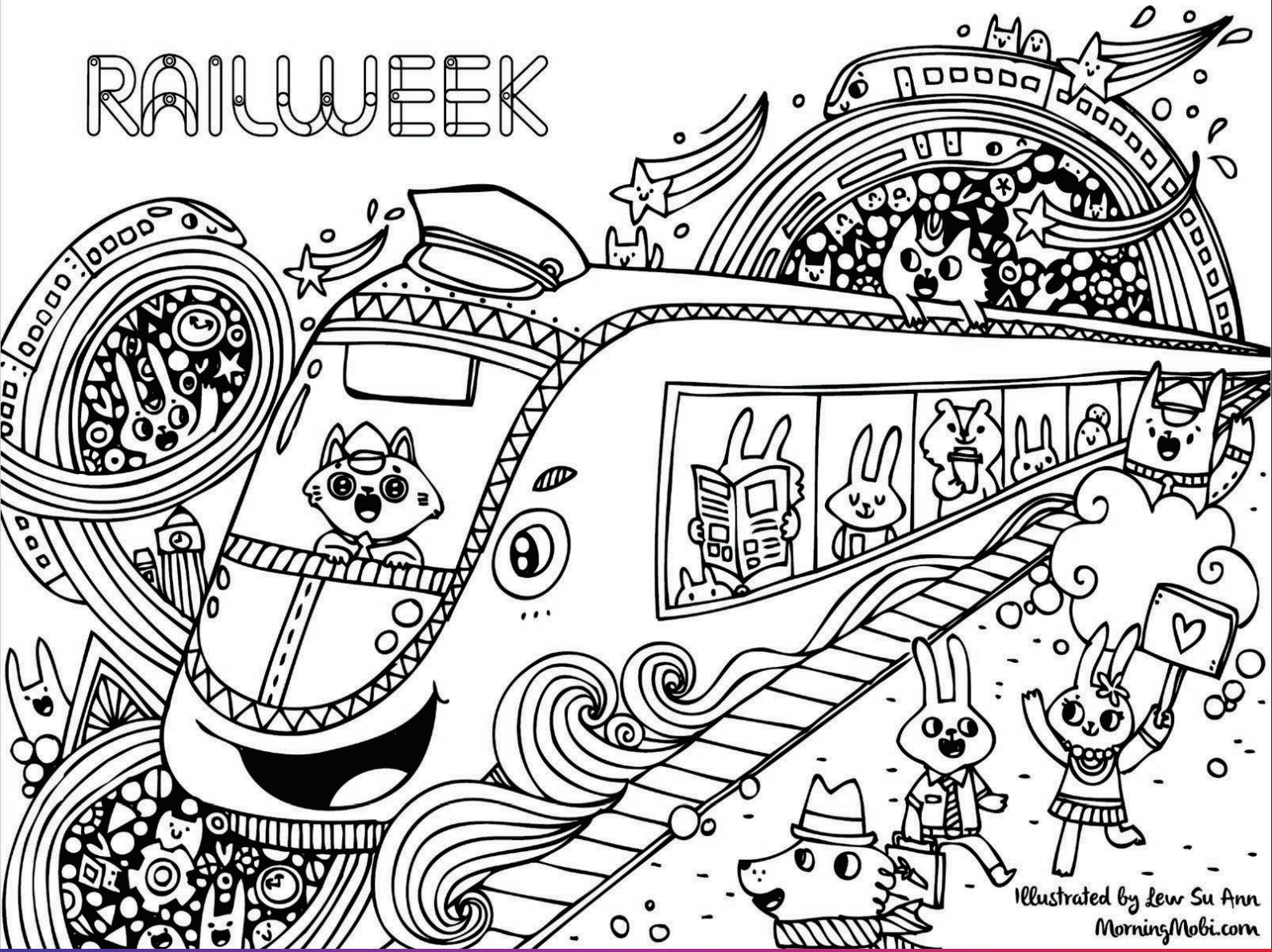
# Colouring



**YOUNG RAIL  
PROFESSIONALS**

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

## RAILWEEK



Illustrated by Lew Su Ann  
MorningMobi.com



into rail

## RAILWEEK

8 - 14 OCT 2018



[railweek.com](http://railweek.com)



@intorail #railweek



@intorail

# 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       = .....

Now you've done those, can you work these out?

4.  +  +  = .....

5.  +  +  +  = .....

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

7.  +  +  +  = 17       = .....

Answers: 1 = 4, 2 = 2, 3 = 7, 4 = 10, 5 = 20, 6 = 26, 7 = 9



# What type of rail engineer am I?

## GB Railfreight

Can you match the description to the correct engineer?



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

- |   |   |
|---|---|
| <input type="checkbox"/> A. Software engineer | <input type="checkbox"/> C. Electrical engineer |
| <input type="checkbox"/> B. Civil engineer    | <input type="checkbox"/> D. Mechanical engineer |

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

- |   |   |
|---|---|
| <input type="checkbox"/> A. Software engineer | <input type="checkbox"/> C. Electrical engineer |
| <input type="checkbox"/> B. Civil engineer    | <input type="checkbox"/> D. Mechanical engineer |

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

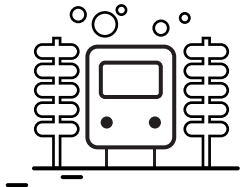
- |   |   |
|---|---|
| <input type="checkbox"/> A. Software engineer | <input type="checkbox"/> C. Electrical engineer |
| <input type="checkbox"/> B. Civil engineer    | <input type="checkbox"/> D. Mechanical engineer |

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

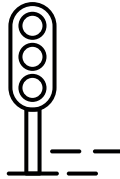
- |   |   |
|---|---|
| <input type="checkbox"/> A. Software engineer | <input type="checkbox"/> C. Electrical engineer |
| <input type="checkbox"/> B. Civil engineer    | <input type="checkbox"/> D. Mechanical engineer |

# I spy

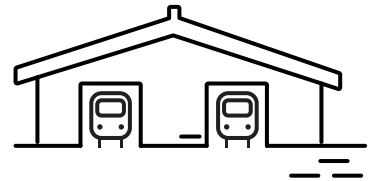
When you travel on the train today, circle all of the things you see out of the window!



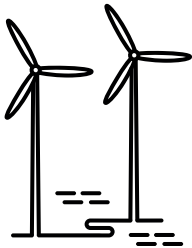
Train wash



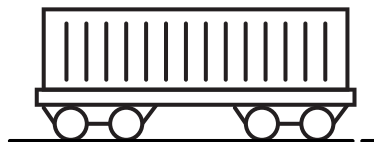
Signal



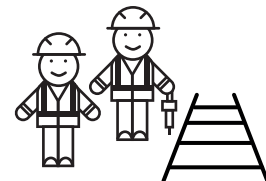
Train depot



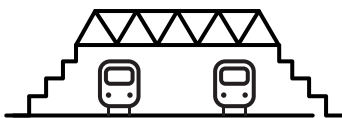
Windfarm



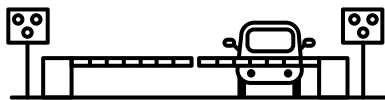
Freight container



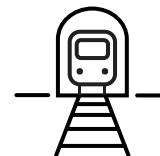
Track workers



Foot bridge



Level crossing



Tunnel

Can you spot anything else?

1. ....

4. ....

2. ....

5. ....

3. ....

6. ....

# Design a train



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



## Win a family trip on the Eurostar!

Enter the competition to win four return tickets for a trip from London to Paris, Disneyland or Brussels! Simply ask an adult to e-mail in a photo of your entry with your name and age to: [engineer@britainrunsonrail.co.uk](mailto:engineer@britainrunsonrail.co.uk), or post your picture on twitter and mention @Britrunsonrail in the tweet.

(Closing date is the 25th August 2018)

T&Cs: By entering this competition you are giving Britain Runs on Rail and Year of Engineering permission to promote your picture submitted, along with your name and age in promotional material. All entries must be submitted by 25th August 2018 midnight. The winner will be announced in September. The prize is for up to four people to travel on a return journey from London to Paris, Disneyland or Brussels. The winner must be one of the people travelling on the trip and further booking conditions may apply.

# A career in rail is more than you expect!

This activity book was funded by the kind support of our industry partners:



We own and operate the railway infrastructure in England, Wales and Scotland on behalf of the nation  
[networkrail.co.uk/careers/](http://networkrail.co.uk/careers/)



We deliver world-class trains, with world-class service  
[hitachirail-eu.com/careers/](http://hitachirail-eu.com/careers/)



We're one of the biggest train companies in the UK, and the only one to operate commuter, regional, sleeper and high-speed services  
[gwr.com/careers/](http://gwr.com/careers/)



We offer world class training across the rail industry  
[ntar.co.uk/our-courses/](http://ntar.co.uk/our-courses/)

## GB Railfreight

We are one of the world's leading rail freight delivery companies. We transport all kinds of items across Britain  
[gbrailfreight.com/recruitment/](http://gbrailfreight.com/recruitment/)



**YOUNG RAIL PROFESSIONALS**

We are the Professional Association for Young People in the Railway Industry  
[youngrailpro.com](http://youngrailpro.com)



a Genesee & Wyoming Company

We are the market leader in providing innovative freight solutions. We transport all kinds of items across Britain  
[freightliner.co.uk/group/careers/](http://freightliner.co.uk/group/careers/)



**ATKINS**  
Member of the SNC-Lavalin Group

SNC-Lavalin's Atkins business is one of the world's most respected design, engineering and project management consultancies  
[atkinsglobal.com/stem/](http://atkinsglobal.com/stem/)

## Rail Delivery Group



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](http://raildeliverygroup.com)



We run a high-speed rail link from England to Europe that runs under the English Channel  
[eurostar.com](http://eurostar.com)

