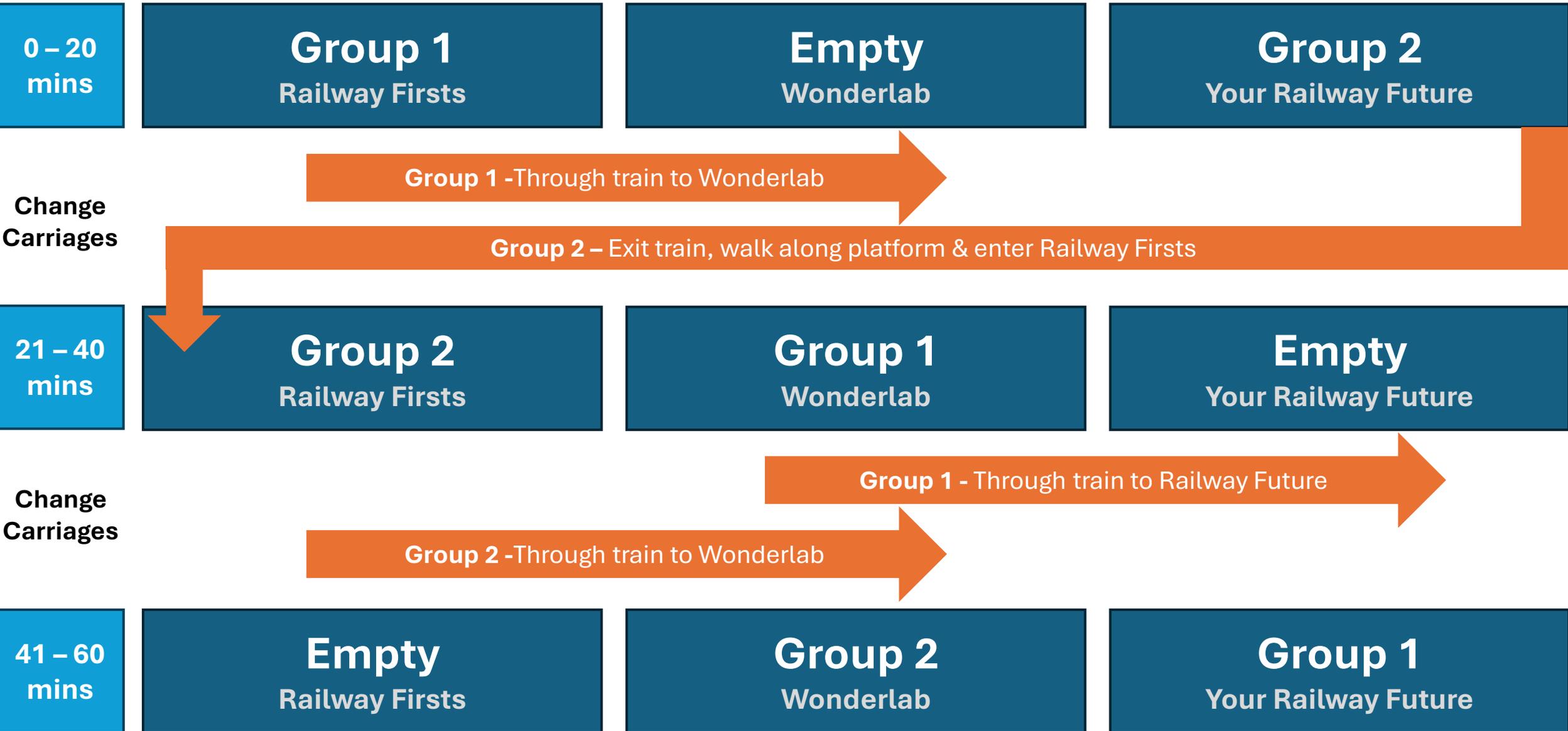# Lesson Plan Overview

- Upon arrival the class is split in half
  - **Group 1** - starts in Railway Firsts (Past Livery)
  - **Group 2** - starts in Your Railway Future (Future Livery)

- The Event Team will help move groups along to keep to schedule

- The time split between carriages can be tweaked based on age to allow younger children more time to explore the Wonderlab & Railway Futures

Movement & Timings

0 – 20 mins	**Group 1** Railway Firts	**Empty** Wonderlab	**Group 2** Your Railway Future

Group 1 -Through train to Wonderlab →

Group 2 – Exit train, walk along platform & enter Railway Firsts

Change Carriages

21 – 40 mins	**Group 2** Railway Firts	**Group 1** Wonderlab	**Empty** Your Railway Future

Group 1 - Through train to Railway Future →

Change Carriages

Group 2 -Through train to Wonderlab →

41 – 60 mins	**Empty** Railway Firts	**Group 2** Wonderlab	**Group 1** Your Railway Future

Railway Firsts
Key message: What happened 200 years ago?

- Speak to teacher first
  - Year 3 - Would they prefer you ask questions or give out the quizzes
  - Encourage the teacher to motivate with incentives (merits etc)

- Introduction from volunteer (Inc. name & job title)

- Give clipboards, question sheets & pens to 'History Detectives'

- They can work in groups up to 3 to answer as many as they can

- Answers vary in difficulty based on location & comprehension

- Bonus questions if they finish early

- First railway memory on wall

See separate document for questions

First Use of Digital Signalling in Britain (2011)

Wonderlab

- Learn through exploring

- Volunteers to assist and give additional information to young people

Sandscape

Sandscape uses an augmented reality technology through laser projection to create a hands-on, interactive experience.

How do landscapes affect the design of railways?
Shape the sand to make lakes and mountains. Watch how the train navigates through the changing landscape.

Imagine you are designing a railway.
You could decide between open tracks, bridges or tunnels to travel across towns, rivers and woodland.
How would your design decisions impact the environment?

Wheels on Track

Which wheel shape works best on a track?
Make your own set of wheels and test it on the track.

Train wheels aren't cylindrical like car wheels, they're conical. The cone shape allows them to move from side to side so the rail vehicle stays on both straight and curved tracks.

This design enables trains to navigate turns, balance and stay on the track more effectively. As the train moves around a curve, the outer wheel travels a slightly longer distance, effectively acting as if it were larger.
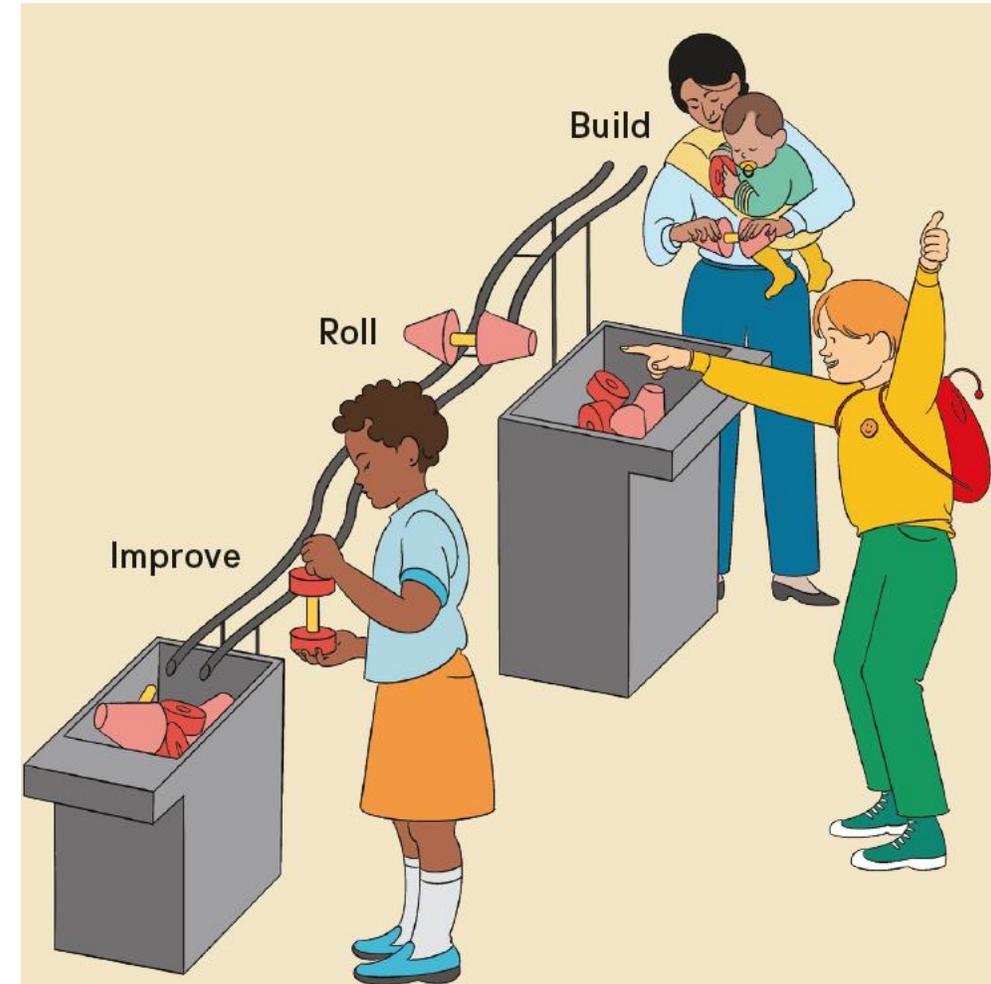
Bridge Builder

Use the blocks to create a unique bridge structure across the valley.

Challenge yourself with the three different building points.

What is the most interesting design you can create?

Engineers build a variety of brilliant bridges that help us move across the landscape. They think about how the structure will support the weight of the bridge itself, plus whatever goes over it.

How many different bridge designs will you see on your journey home?
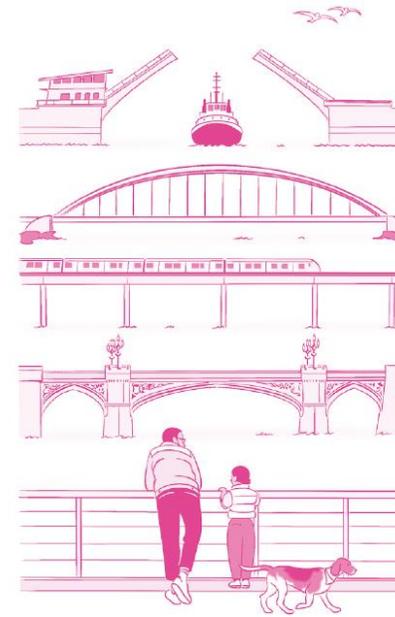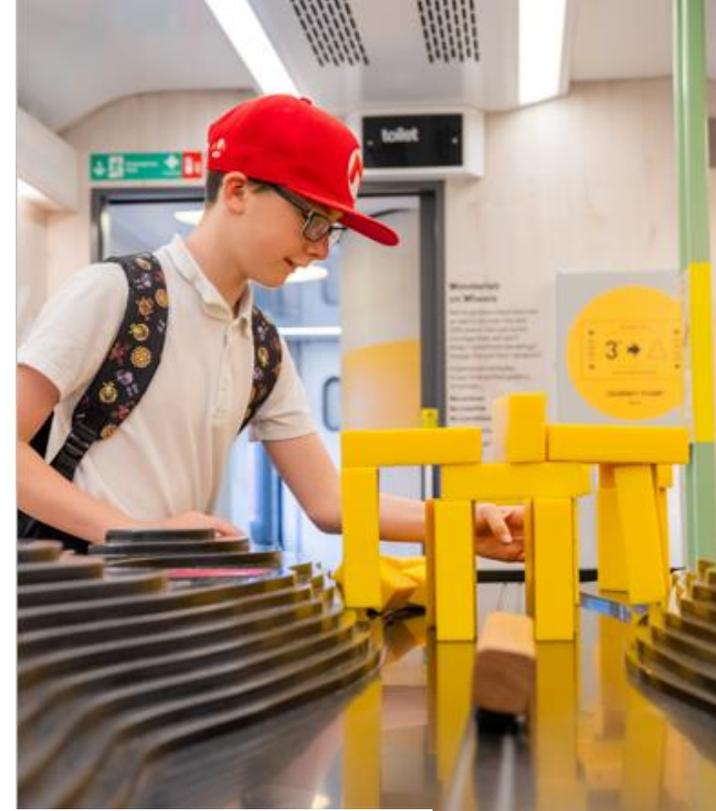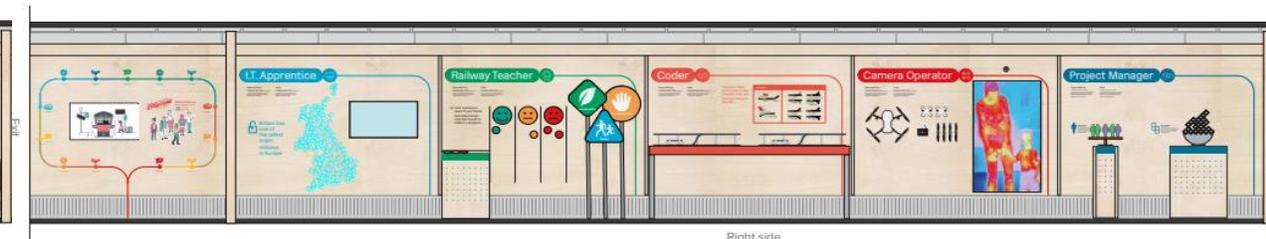
Your Railway Future
Key message: There is a role in rail for everyone

## **Suggested** Volunteer Roles (depending on numbers)

1. Coder (MUST practice Intelino first & guide)
2. Freight Manager & Engineer (Make button pressing meaningful)
3. Camera Operator & Project manager (Link task to project management)
4. Timetable Planner, Weather Analyst & Ecologist
5. IT Apprentice, Railway Teacher & Postcard Distribution

Your Railway Future
Key message: There is a role in rail for everyone

- Laminated sheet for each task covering all the activity key points & **Engagement Questions** to ask children

- Volunteers are not expected to 'teach' or 'lead' a session.

- The role is to use prompt questions to move from *'play'* to *'learning'*
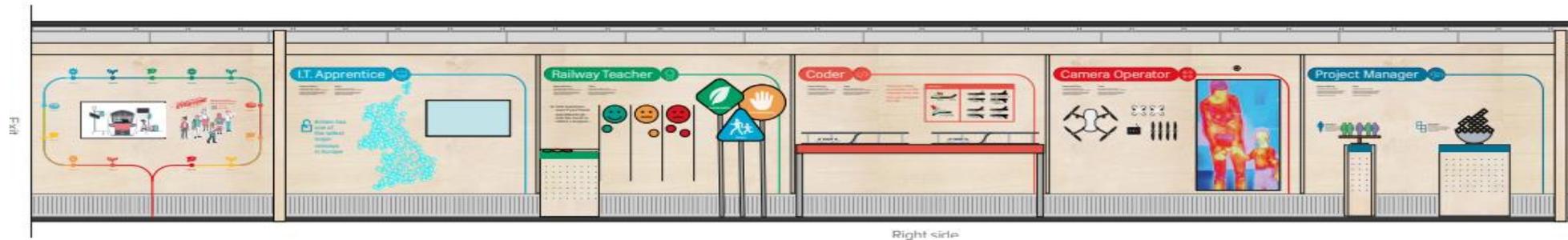
Project Manager

Can be independent but to get the most out of this activity, the young people will need to be encouraged to read the task.

Engagement Questions

- What roles could these figures represent?
  - (Engineers, finance HR etc)
- What things could shapes represent?
  - (Budgets, deadlines, stakeholders, comms, risk)

Freight Manager

Engagement Questions

- What are biomass pellets?

- What would be the impact of removing 76 lorries from our roads?

- If each freight wagon can hold the equivalent weight of 75 large horses how many horses could **x** freight wagons hold?
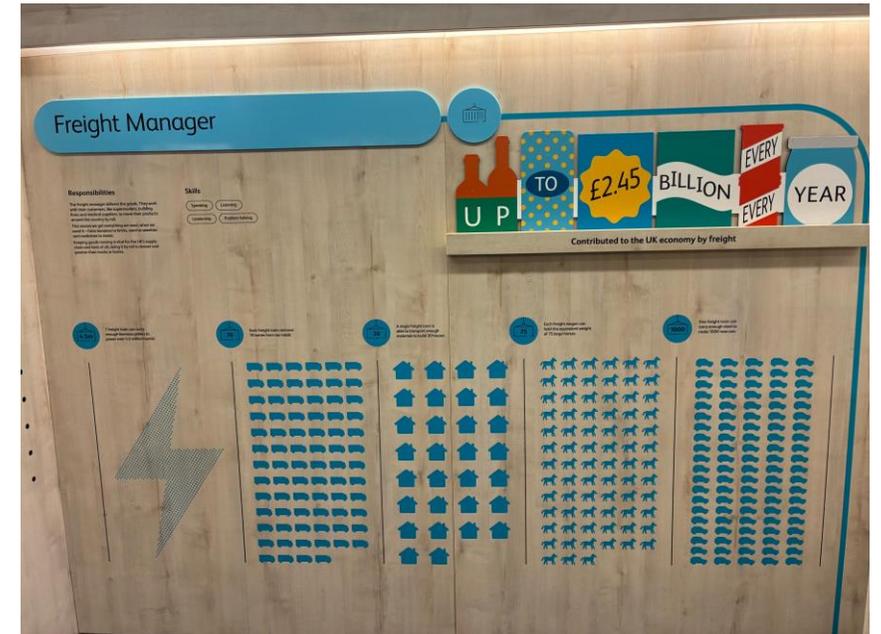
Engineer

Tunnel boring machine

- Turn all lights off first – get children to guess which part will light up before they press each button
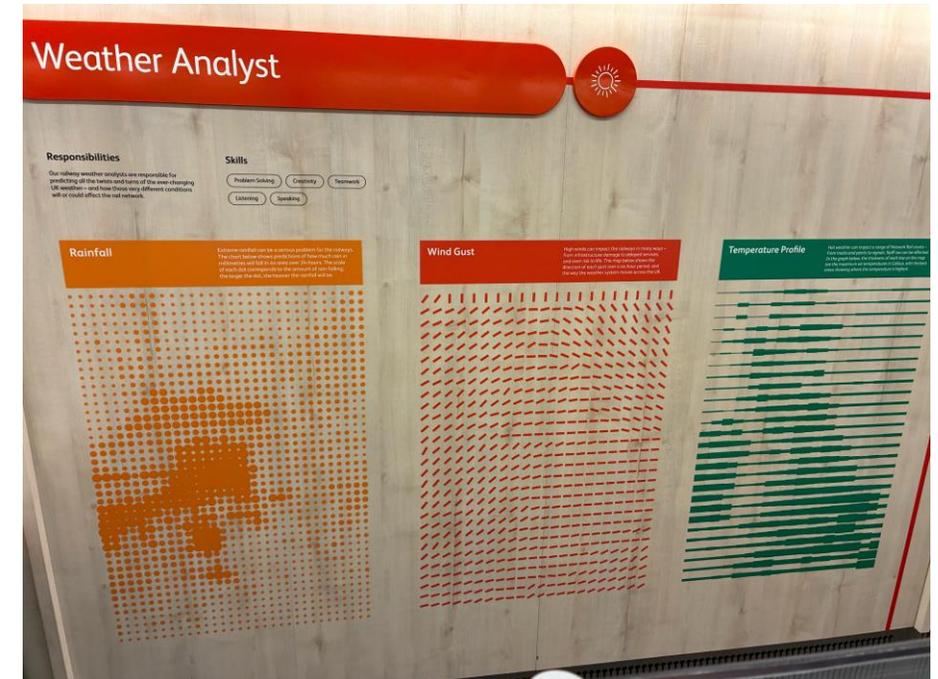
Connecting the railway game

- Very quick demo & remind them to read the instructions

Weather Analyst

Engagement Questions

- What causes change in wind direction?

- What are the implications of changes / poor weather?

- How do you think climate change will impact the railway in the future?

Coder

Needs guidance - Point out instructions and demonstrate how to code trains

Explain that the Intelino train isn't just young children by physically showing the sensor & exploded diagram

Engagement Questions

- Where is it safe to go fast /slow?

- What would happen if the train stopped?

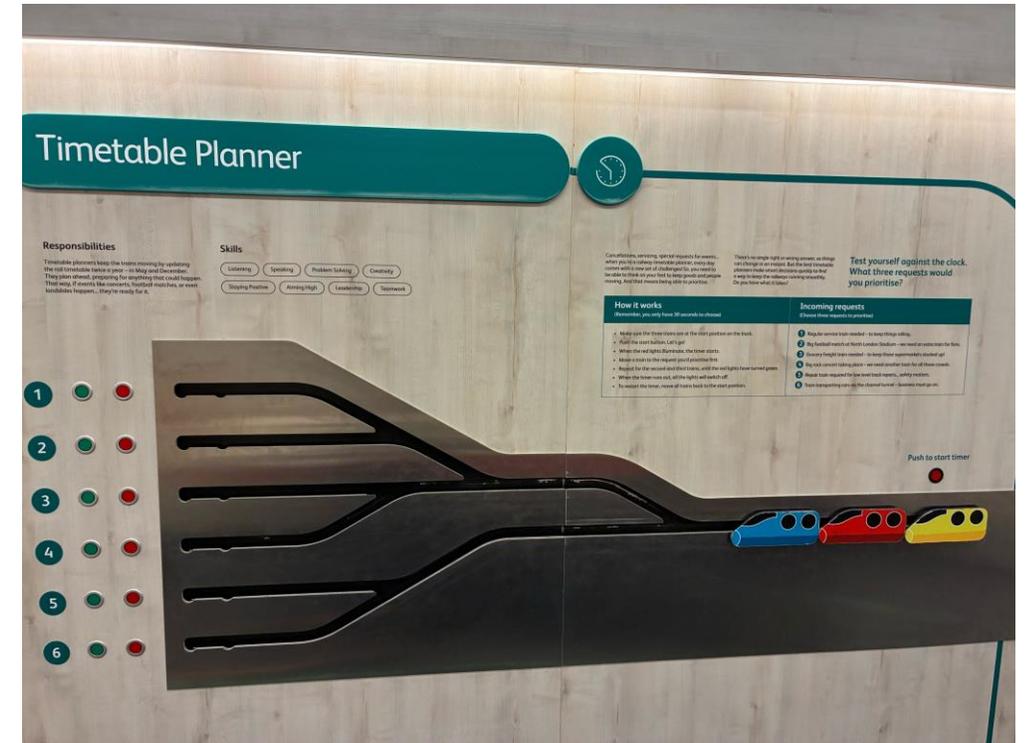- What impact would it have on people?
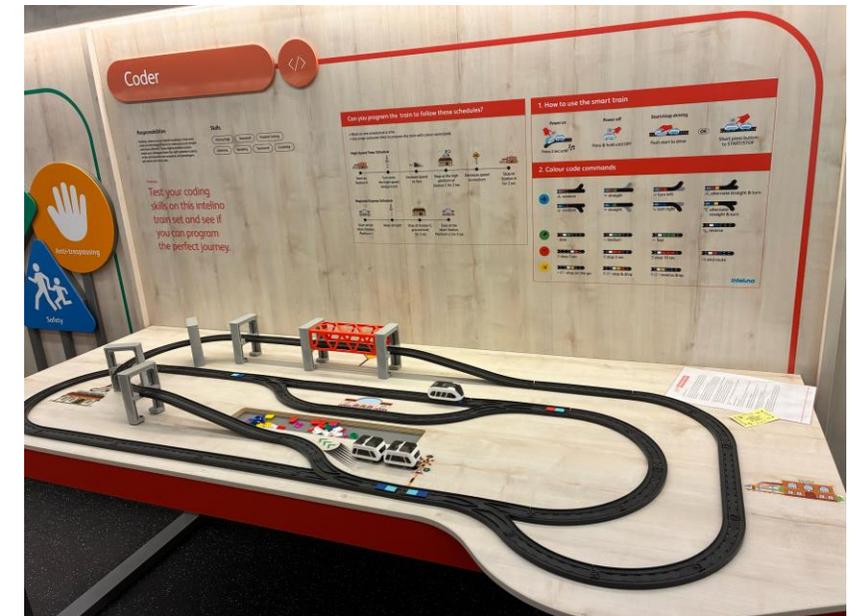
Timetable Planner

Needs guidance to explain task – don't rely on them reading it

Engagement Questions

- Find out what events the young person enjoys (Football, concerts, day trips, visit family)

- Get young people to think about the impact of their priorities on others and justify their answers

- Volunteer to set timer

Railway Teacher

Engagement Questions

Ask additional safety questions included some that do not have clear answers such as:

- Is it safe to take a selfie on a crossing?

- Is it ok to wear headphones whilst waiting for a train?

- If you see someone stuck on the tracks, should you help them?

- Can trains run on tacks that look old and unused?

- How would explain it is dangerous to a younger child?

Camera Operator

Engagement Questions

- Where is the Thermal camera?

- What part of your body is hottest & why?

- Can you change the colour of your hands by rubbing them together?

- What do the buttons on the drone control do?

IT Apprentice

Explain the game is just a demo and hand out flyers with QR code to download

Engagement Questions

- Who can count the LEDS fastest?
  - (83 – I think!)

- What would happen if criminals *'hacked'* the train network?

Ecologist

Engagement Questions

- What are the names of some British wildlife?

- What are the implications of building a new line?

Exit

Hidden Roles in Rail iPad Quiz

- Prompt them to read final page after doing the quiz (they often just read the title!)

When the session finishes, ask if everyone has a postcard

- If not let them choose and take one