

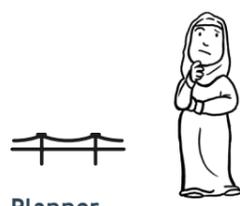


Fixer

Construct a bridge for passengers to safely cross the train tracks. Create a gap to build your bridge over, using chairs or books, for example.

Using only paper/newspaper, scissors and sticky tape, you have 10 minutes to build your bridge.

Test how each bridge reacts to weight being added. The strongest bridge wins!



Planner

Design a brand-new station for your Tube line. Think about who will use it, what facilities it needs, and how it will be different to other stations. Make a drawing to show what it will look like.

You have 10 minutes to plan your design. Vote for your favourite design to decide the winner.



Dreamer

You must persuade everyone that a Tube line extension is a good idea, so you can be sure you will have enough money to complete the project.

Spend up to five minutes preparing a presentation with your ideas, and remember to use persuasive language!

Each player presents for up to two minutes, then vote to decide the winner.



Fixer

Oh no! The conveyor belt on your tunnelling machine has broken. You need to quickly create a new chain to fix the problem and keep the soil moving out of the tunnel.

Using only paper/newspaper, scissors and sticky tape, create the longest chain you can.

You have 10 minutes. The longest chain wins.



Planner

You have to find a way of powering Tube trains using renewable energy. You have 15 minutes to create a simple vehicle powered by wind energy.

The vehicle that travels furthest is the winner.

Suggested materials: card or plastic bottle (vehicle body), bottle lids (wheels), straws (axles), balloons (wind power), sticky tape, elastic bands, blu-tack.



Dreamer

It is important that everyone travels safely on the Tube. Each player chooses a type of passenger (e.g. a person travelling with a pram, guide dog or wheelchair) and suggests three ideas to make a Tube train safer and better for their journey.

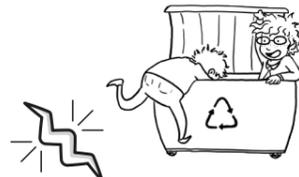
Spend five minutes planning your ideas and two minutes presenting. Vote to decide the winner.



Fixer

Uh oh – signal failure! We need another way to communicate with the train guard. Using two paper cups and a length of string, and a sharp pencil or scissors to make a hole, construct a telephone that allows you to speak to someone in the next room. The telephone which communicates the clearest message is the winner.

Tip: Make sure the string is tight. If needed, tie each end of the string around a small object to hold it inside the cup.



Planner

You need to generate electricity for a new station. Can you make your own static electricity? You have two minutes to each find one material to test. Test your material by rubbing it against your hair and slowly moving it away from your head. The person with the most hair standing on end is the winner.

Tip: Try a balloon, polystyrene cup or plate, plastic bag, bubble wrap or nylon tights.



Dreamer

You need to find a renewable source of electricity to keep the underground system moving. Think about which source of energy you will use and where you will get it from. You have five minutes to draw a map showing how you will transport it from its source into London. Vote for the most practical plan to decide the winner.

Tip: Renewable energy comes from resources that will never run out, such as sun, wind or tide.

Going Underground

A game for three or more players
Recommended for ages seven and over
Game lasts 40-60 minutes

Your task is to step into the shoes of real-life engineers and compete against each other to win the most challenges.

Our city is growing fast – already up to 5 million journeys are made on the Tube every day, and it's only going to get more crowded. Transport engineers play a vital role in solving this problem. They help create new and improved ways to travel in London. In fact, engineers are so important, we're going to need **186,000** more engineers every year until 2024.

Could you be one of them?



How to play

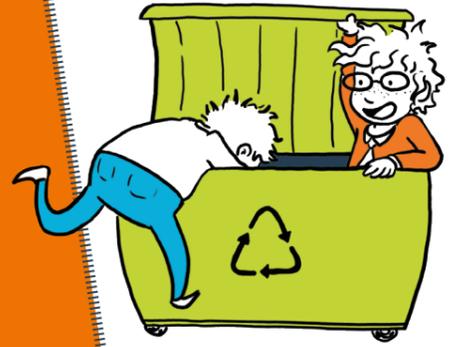
1. Cut out all nine cards on the following page.
2. Spread them out on the table with the picture side facing up.
3. The youngest player goes first. Pick a card and read the challenge out loud.
4. Everyone takes part in the challenge. If you need to vote on the winner, remember that you can't vote for yourself.
5. The winner of the challenge keeps the challenge card.
6. The first player to keep two challenge cards is the winner.



Finished quickly? Play again!

Each challenge uses different materials that you can find around your home or classroom. Some of the materials that you might need are:

- Scrap paper or newspaper
- Card or cardboard
- Sticky tape
- String
- Elastic bands
- Straws
- Blu-tack
- Pencils
- Scissors
- Paper cups
- Balloons
- Timer
- Some of the following: polystyrene; plastic bags; nylon tights; bubble wrap
- Materials from your recycling box (e.g. bottle tops, plastic bottles)

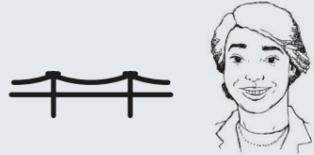


Meet the engineers

Who are the engineers on your cards? Here are some current engineers and how they keep London moving.



Ellie Hurley-Simister



Hello! I'm studying for a degree in **civil engineering**. I work on rail projects, helping people get from A to B safely and comfortably by inspecting the bridges, roads and buildings around us.

Huzaifa Essajee



Hello. As an **electrical engineer** I find solutions for electrical problems so that objects are safe to use. For example, I make sure people who use trains don't get an electric shock when they touch them.

Dick Dixon



Hiya! I am a **mechanical engineer** and I specialise in repairing railway tracks. My favourite part of the job is replacing railway bridges because it allows me to work alongside lots of different types of engineers.

Melanie Barker



Hello, I am a **civil engineer** and I ensure that our world is designed and built in the best way for us to travel easily and quickly. I like that I am making London more accessible so everyone is able to use our transport network.

Neera Kukadia



Hi, I'm a **mechanical engineer** responsible for upgrading London's Underground stations, including installing new moving walkways and ensuring designs meet fire regulations.

Akhila Attiganal



Hello, I am an **electrical engineer** and I enjoy using modern technology including tablets and 3D interactives to carry out maintenance activities, to make sure the equipment on the trains is working.

Visit London Transport Museum to find out about **Sir John Fowler**, **Werner von Siemens**, **Isambard Kingdom Brunel** and lots of other engineers.

About us

This game was designed by London Transport Museum to help introduce children and families to engineering through fun and hands-on challenges.

London Transport Museum uses the story of transport to encourage, enrich, and inspire all Londoners and those who love this city to get the most out of London.

At London Transport Museum, we create opportunities for young people to explore the world of engineering and think about the part they might play in the story of London's transport.

Find out more about engineering and careers in transport by joining us for one of our exciting STEM sessions for families or schools, visit ltmuseum.co.uk/learning

Find out more online, visit ltmuseum.co.uk/whats-on/year-of-engineering/future-engineers



enjoyment to employment

ltmuseum.co.uk
Registered charity number 1123122



Sir John Fowler



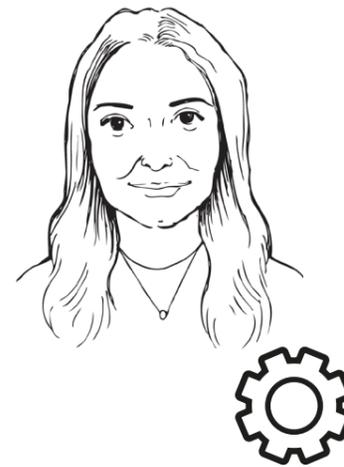
Melanie Barker



Ellie Hurley-Simister



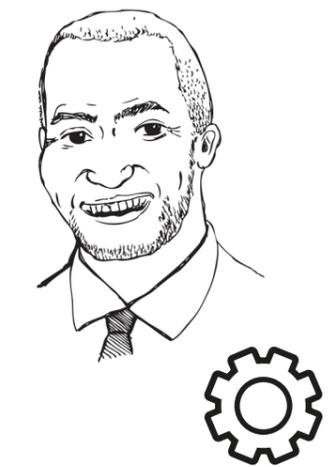
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