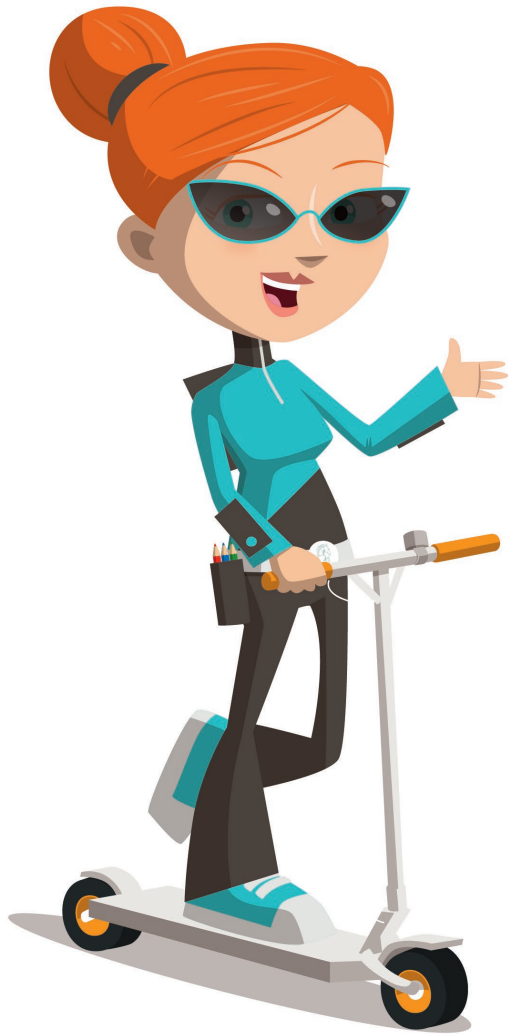




Q&A TRANSPORT



Q1: There are plenty of ways to get around these days, and you can travel by **land, **water**, or **air**! Can you link the various ways in which people are moving in the poster to the correct type of transportation?**

A: Lots of people in the poster are traveling on **land**. Some are driving cars (F,4, A,3 and B,3), some are in trucks and vans (D,4 and I,4), some are taking the bus (D,4), and some are riding the rail, whether that's an underground line (B,1) or an overground service (B,5). Others are getting some great exercise as they travel about! There are plenty of walkers and cyclists to spot, and even a speedy skateboarder (C,3), a rad roller-skater (B,3), and a scooter-commuter (F,2)!

(G,2), boat (H,2), or a snorkel-powered swim (D,2), **water** can provide a great way of getting around!

Finally, some people are travelling by **air**. This includes the holidaymakers on the planes passing through Middletown Airport (E,5 and G,5), as well as the helicopter pilot soaring through the sky (E,6), and the hot-air balloon drifting through the clouds (B,6). They could even, if they were feeling brave, take a ride on the back of the Leica dragon!

Some travellers are taking advantage of the Middletown waterway. Whether it's by paddleboard



Q2: Surveyors play a very important role in the construction of roads, pathways and railway lines. What do you think they might look at when deciding where to put a new transport route?

A: Before engineers and construction workers can build anything, they seek help from skilled surveyors. You can see lots of survey work going on in the poster – the Seiler Geospatial surveyor in (A,3) is using a drone to capture an aerial view of the waterway and the surrounding area. They could use this data to help plan out a new cycle path. The Bassline Surveyor in (D,1) is using a scanner to collect data in the underground train station; the measurements they collect could be used by engineers who want to modify the platform.

A surveyor's job is to measure and collect data on the condition of the land where any building work is to happen – this includes what the land is like (is it

hilly or flat? Is the ground soft or hard?), as well as information about other surrounding structures (are there any buildings where the pathway would go? Are there pipes underground that would be damaged by digging? Who does the surrounding land belong to, and where exactly are the property boundaries?). If this data is incorrect, or incomplete, dangerous mistakes could be made in the building work that follows. Even a small error – just a few millimetres – could cost millions in repair work later. This is why the work of surveyors in transport construction is so important; they help make sure that our roads and pathways are wellbuilt, safe, and will work effectively with the surrounding environment for many years to come.

Q3: Can you spot the GeoSquad racing along the bike path? They're making a daring escape, but they're also being kind to the environment! Which modes of transport in the poster can you identify as non-polluting?

A: Maddison is tearing up the tarmac on her skateboard, while Setsuko and Miles are using peddle power to propel themselves away from the school bully, who wants their special, time-travelling VR headsets for himself! Thanks to the well-planned, conveniently-placed, smoothly-laid path, they are able to cut quickly through the centre of Middletown and make their escape! Planning for things like cycle and walking paths is important, and surveyors help to decide on the best, safest routes, so that the public can make as much use of them as possible.

All the people who are walking, skating, travelling in a wheelchair, cycling, skateboarding or riding scooters are making their way to their destinations without harming the natural environment at all - thanks, in part, to the surveyors who planned their route! Surveyors will also contribute to the planning of other solutions that help to cut down on pollution and congestion, such as special bus lanes, shared-use paths and roads, and public transport links, like tramlines and railways.



Q4: Have you seen Sammy the Spider and his green and blue webs? Spiders can sense movement across their webs - but Sammy isn't trying to catch flies! What kind of movement is he on the lookout for?



A: Sammy's web is special - it's wireless! Sammy has an invisible network made up of something called 'sensor nodes', and each of those nodes attaches to the ground, or to a building, or even to a railway line. Just like a spider can sense movement in any part of its web (for example, when a tasty fly lands on one of the strings!), Sammy can sense movement right across his web of connected devices.

The super-smart sensor nodes are made by a company called Senceive, and they collect movement data around the clock; the long-range webs (represented by the blue lines) take measurements every hour (up to 15km away), and the shorter-range webs (represented by the green lines) collect data once every minute! That equates to 525,600 measurements a year! If Sammy notices movements that are too big, or unexpected, he is able to tell engineers so they can check the area for potential dangers. The sensor nodes are so smart, they can send data to neighbouring sensors, and the system will still work if some parts of it are damaged! Sammy uses his terrific web-tech to help keep the transportation systems, the surrounding structures, and the people who use the transport links, all safe and sound.

Q5: The Canadian surveyor is taking a selfie with a three-legged friend in front of the bridge. Do you know what the friend is?

A: That happy-looking three-legged device is a Global Positioning System (GPS) receiver and tripod. These pop up in just about every exploration poster; they are a favourite tool of surveyors! Their job is to provide the surveyor with their exact location, and - thanks to a network of space satellites - the receivers can complete this task pretty much anywhere on the planet! This means that, whether the surveyor is working up a mountain, deep inside a rainforest, on top of a glacier, or in the centre of Middletown, they can always get their hands on accurate location data when you get a clear view of the satellites.





Q6: Can you spot Benny the Bearded Bridge Troll surveying the bridge? Why do you think it is important to check the condition of bridges?

A: Benny is busy - he has an extremely important job to do. In fact, if Benny wasn't there to check the condition of the crossing, and how much weight it was able to take (its 'load rating'), the result could be a badly broken bridge, followed by a calamitous accident! One of the best ways for Benny to survey a bridge is by using a laser scanner. This allows him to stay clear of traffic while collecting data. Because a bridge like this would be used by very heavy vehicles (e.g. school buses, construction vehicles, emergency services such as fire trucks, and farming equipment like tractors), it needs to have a heavy load rating to allow hefty forms of transportation to travel safely across. Benny will also check the safety of the guard railings on the top deck of the bridge, which keep pedestrians and vehicles from falling over the edge.

Q7: Did you notice the mobile mapping system on the road? Can you remember what a mobile mapping system does from our past posters?

A: The LiDAR scanner attached to the roof of the vehicle in (C,4) is sending out millions of laser beams, each collecting single measurements of the road as the car drives along. The surveyors can then compare this information to the results from previous scans to check for any measurements that are out of place. If any differences are found since the last scan, it might mean that a crack or a pot hole has developed in the road, and someone needs to come and fix it in order to keep transportation running smoothly and safely.

