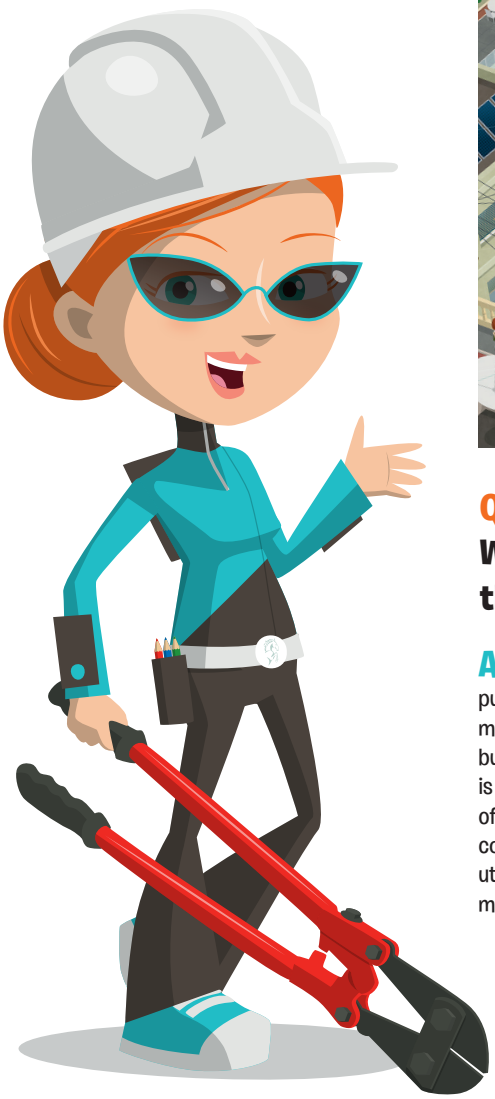
GET KIDS INTO SURVEY®

Q&A

UTILITIES

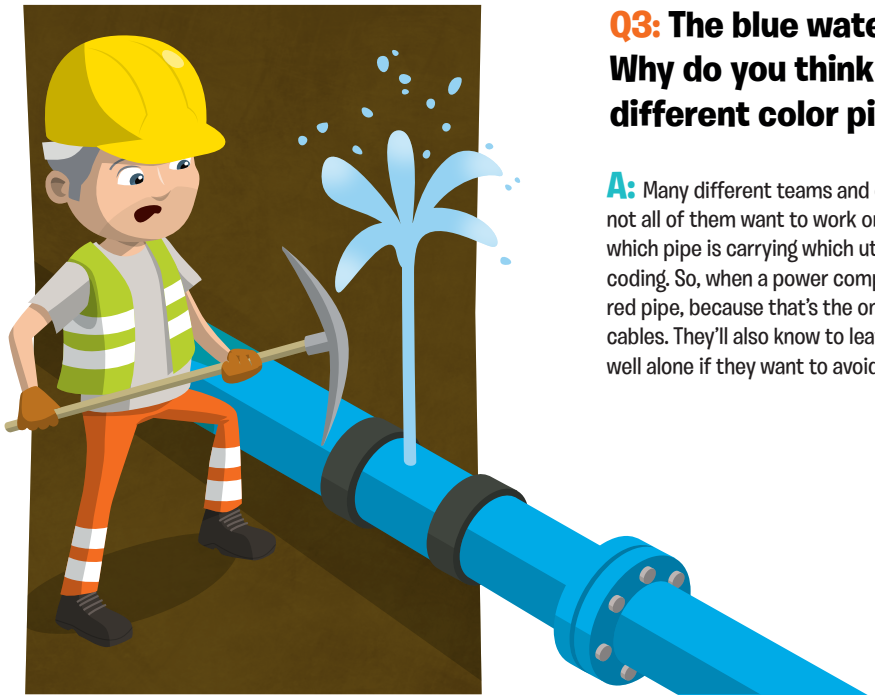


Q1: The team outside the Survey HQ are mapping utilities. Why do you think it would be important to know where things like underground water pipes and power lines are?

A: **Utility mapping** involves locating and labelling public utility mains, and underground utility mapping means to detect, position and identify buried pipes and cables beneath the ground. It is important to know the location and direction of these utilities in order to keep them working correctly. That might mean making sure that new utilities aren't installed anywhere hazardous, or it might mean protecting the safety of existing utilities – for example, if building work was being carried out nearby, it would be good to know where power, gas and water lines were, so that none of them were accidently dug up or damaged! Unfortunately, it looks like it's a bit late for the clumsy worker in (F,2)! Someone fetch a bucket... and a really big band-aid!

Q2: Can you spot the different types of survey equipment used to detect the position of the utilities underground?

A: While a few surveyors are using Total Station scanners on yellow tripods to scan the surface of the dig sites, those can only 'see' what's above ground. The piece of technology that can scan through solid surfaces is called a **Ground Penetrating Radar**, or GPR for short. It pushes powerful sound waves deep underground, then measures the echoes as the sounds bounce back off solid objects, like water and gas pipes. There's a surveyor using a GPR unit in (G,2) – it looks like a big yellow lawn mower!



Q3: The blue water main has sprung a leak! Why do you think it's important to have different color pipes for each utility?

A: Many different teams and companies work on underground utilities - but not all of them want to work on the same lines! As such, it's important to know which pipe is carrying which utility, and the easiest way to do this is by colour coding. So, when a power company digs below ground, they'll be looking for the red pipe, because that's the one that carries electric power lines, conduits and cables. They'll also know to leave the blue pipe (which carries drinking water) well alone if they want to avoid a shocking surprise!

Q4: If drinking water pipes are color-coded blue, and electric power lines are red, can you guess what the other color pipes in grid (F,2) might be carrying?

A: Here's the color coding guide for all the major utilities lines; it helps anyone working below ground to identify exactly what each pipe is carrying:

Electric power lines, conduit and cables.

Telecommunication, alarm or signal lines.

Gas, oil, steam, petroleum, or other flammable material.

Sewage and drain lines.

Drinking water.

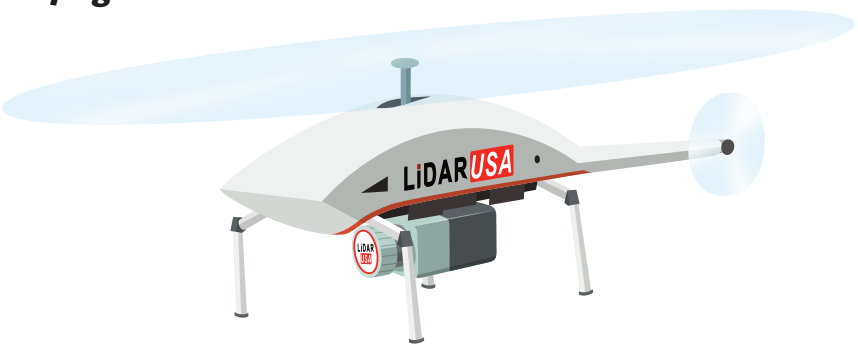
Reclaimed water, irrigation, and slurry lines.

Temporary survey markings.

Proposed excavation limits or route.

Q5: Can you spot the LiDAR USA drone? What do you think it might be surveying?

A: The LiDAR USA drone is soaring through grid (D,3), flying over the above-ground utilities (in this case, the power lines) to check them for sags, wear and tear, and what surveyors call encroachment - where trees might have fallen onto the lines. It might also be showing off its impressive wingspan to all the birds that have parked their feathery behinds on the power lines!



Q6: What is Captain Alice showing the kids in grid (E,5)

A: Captain Alice is a **cartographer** - a maker of maps! She takes information from land surveys, aerial scans, photography and other sources to create up-to-date maps. The map that Captain Alice is showing the kids will also be useful to the surveyor standing with them, as it will show land and property boundaries, helping him to know exactly where to work! Meanwhile, vehicles like the orange **MK Surveys** truck (D,5) are using LiDAR to do mobile mapping of the streets, collecting data that will feed into Captain Alice's maps, while simultaneously scanning the surface of the road for pothole damage or cracks!

Q7: Check out the orange MK Surveys truck at (D,5) - can you figure out how their above-ground survey scanning might help the teams working on the utilities belowground?

A: The teams working underground will have a utility survey - a detailed map of the pipes and structures that run beneath the surface of the street. But they also need a matching above-ground survey map; one that tells them where the utility pipes feed into things like lamp posts, traffic lights and buildings. That's where MK Surveys come in! They use a sophisticated mobile mapping system to collect scan data as they drive around. This data is used to create a 2D or 3D map of all the above-ground features, which can be laid over the utility workers' underground survey map, so that they know what's going on all around them - without having to close roads and dig up the streets! Super handy!