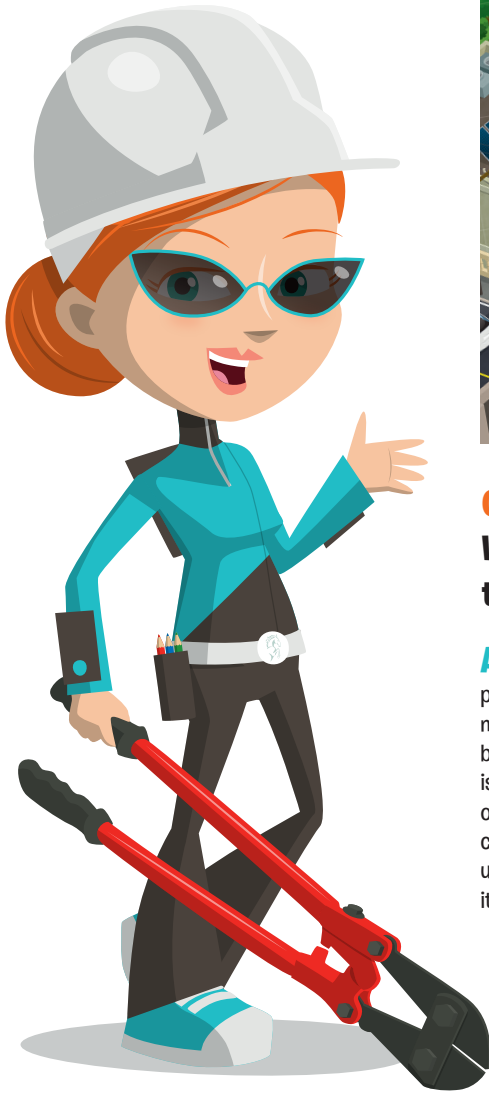# GET KIDS INTO SURVEY®

Q&A
UTILITIES (US)

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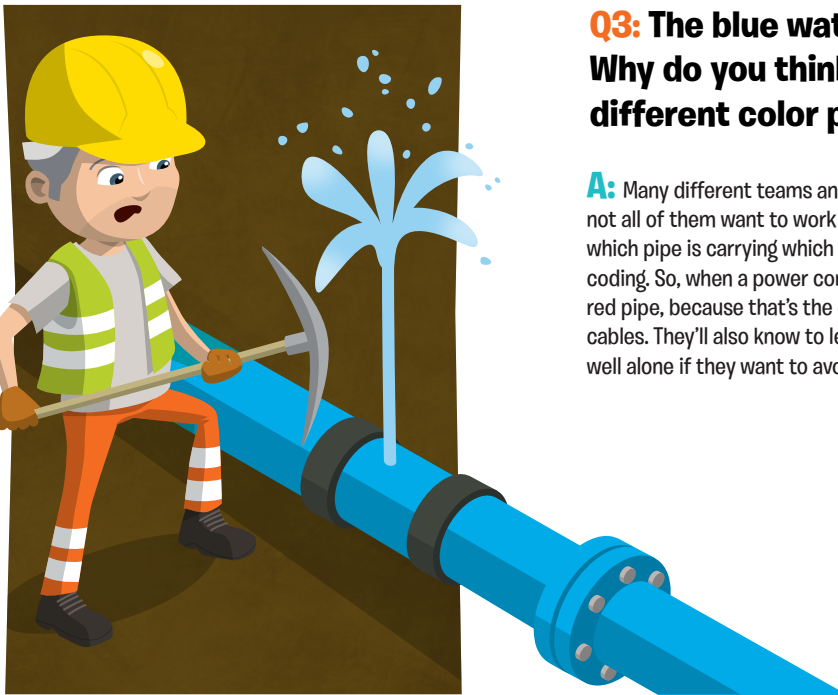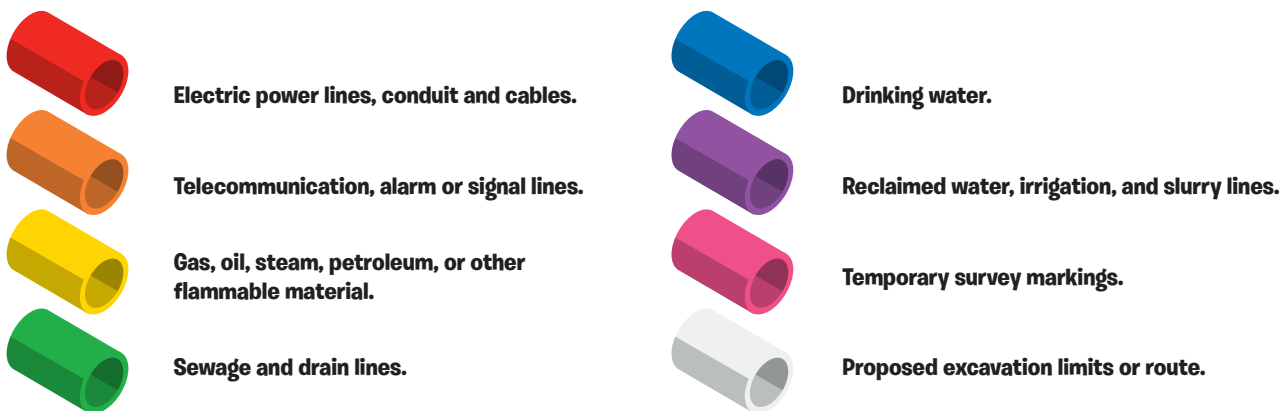
Q3: The blue water main has sprung a leak! Why do you think it's important to have different color pipes for each utility?

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 Monsen Engineering drone? What do you think it might be surveying?

A: The Monsen 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!
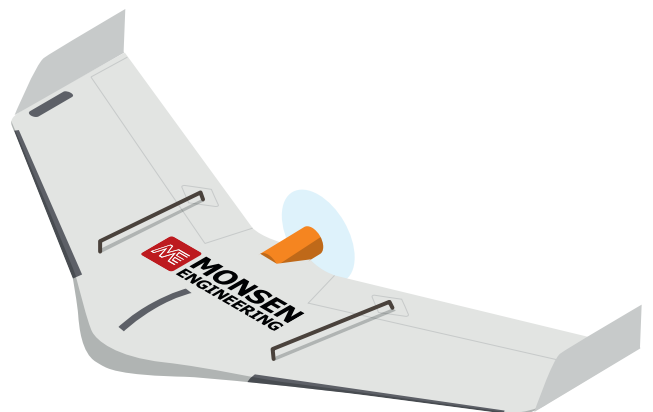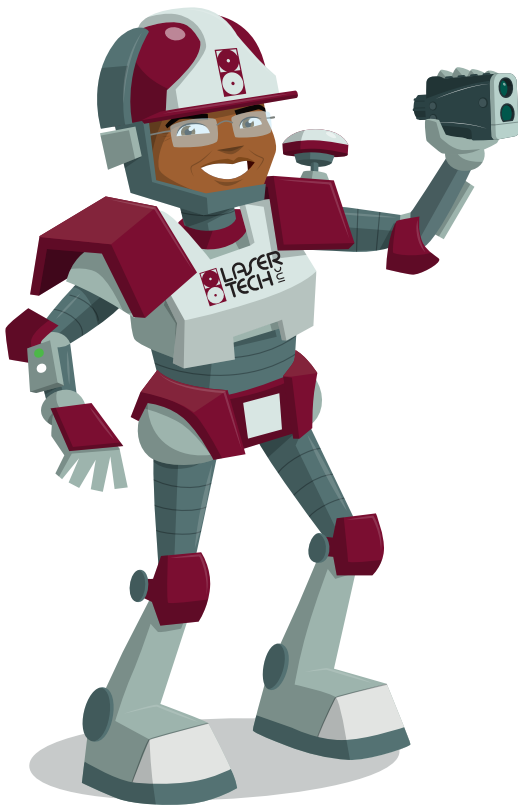
Q6: What is Robo Roosevelt showing the kids in grid (E,5)?

A: When Robo Roosevelt goes binocular shopping, he has to find a pair that matches his style - sleek, smart and loaded with tech! He's treated himself to a Laser Tech TruPulse 360 Rangefinder, which not only allows Robo Roosevelt to see things at great distances, but it also helps him to make measurements of heights, widths, and degree of slopes, all while adapting to harsh light and adverse weather conditions. It's definitely his new favorite toy!

Q7: Can you spot Bengal Cat? He's using his Carlson Rover (a piece of technology that tells the surveyor their precise location) to do a very important job: marking utility easements. Can you find out what this means?

A: Utility Easement happens when public utility lines, like water pipes and power cables, pass through land that is not publicly owned. This usually happens when the safest and most sensible path for a utility line is across privately owned land - and in that situation, an agreement has to be made between the utility companies and the land owners for access. Surveyors help to make sure the utilities are positioned correctly and are carefully maintained. They use markers in the ground, called monuments to help with this. That's what Bengal Cat is doing - using his satellite-guided positioning technology to locate monument markers and work out the exact site of the easement.