

ON YOUR MARKS, GET SET... DRONE!



TASK 1:

SMART CITIES AND CLEVER HOUSES

(COMPUTING LINKS - NETWORKING AND SAFE DEVICE USE)

A smart city is an urban area that uses a network of connected devices (called an 'internet of things') to collect information, which is used to help the city run more efficiently. Efforts to improve 'urban flow' might include utilities (like power and water), transport, waste management, crime prevention and healthcare provision. A smart city will depend on high speed, reliable data connections, such as 5G and fibre optic lines. To help you understand how different devices play a role in improving the flow of an urban environment, you might think about a modern 'smart home' as a miniaturised version of a 'smart city'.

For your first task, see if you can identify all the devices that are connected in Miles's home. If you can, try to add some of your own; think about all the technology in your house that connects to the internet.

HEY! MILES FROM THE GEOSQUAD HERE, YOUR RESIDENT TECH-EXPERT -- OR TECHSPERT! IF YOU'VE READ THE GEOSQUAD COMICS, YOU'LL KNOW I LOVE COMPUTERS AND GAMING -- BUT MOST OF ALL, I LOVE **DRONES**. I FLY THEM, RACE THEM, DO STUNTS WITH THEM, AND YES, OCCASIONALLY I CRASH THEM! BUT TODAY I WANT TO HELP **YOU** DISCOVER MORE ABOUT DRONES, AS WELL AS SOME OTHER AWESOME TECH, AND HOW THEY FIT INTO **SMART CITIES** -- BOTH NOW AND IN THE FUTURE! ARE YOU READY? THEN LET'S DRONE!



TASK 2:

TAKE A LOOK AROUND

(LITERACY LINKS - FIRST-PERSON RECOUNT WRITING / COMPUTING LINKS - EVALUATING TECHNOLOGY)

One smart device that appears to come straight from the pages of science fiction (or perhaps an Iron Man comic!) is **mixed reality lenses**. Surveyors use this technology to help them visualise new building elements over existing structures. If you look at the London, Sydney or New York Exploration Posters, you can see surveyors using mixed reality lenses, or '**smart glasses**', to help them visualise the position of new escalators in the underground transport stations. The glasses mix real, virtual and augmented reality to give the user extra information about the world around them, right in front of their eyes - no need for a screen!



Data companies predict that smart glasses will become as common as mobile phones in the near future. Imagine you are in the middle of a busy city, wearing a pair of smart glasses. Continue this recount

about what that experience might be like as the world around you comes to digital life, and you find yourself connected to everything...

"AS I HEAD UP THE HIGH STREET I WALK PAST THE GREETINGS CARD SHOP. A VIRTUAL REALITY MODEL OF MY MUM APPEARS IN THE MIDDLE OF THE STREET; I ALMOST WALK STRAIGHT INTO HER! A TEXT ALERT ABOVE HER HEAD REMINDS ME THAT IT'S MOTHER'S DAY THIS SUNDAY, SO I POP INTO THE SHOP AND BUY HER A CARD. BACK OUT ON THE STREET, I MAKE MY WAY TOWARDS A FOOD COURT. AS I GET CLOSE TO THE PIZZA PLACE I SEE A..."



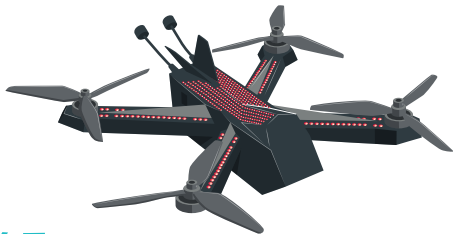
TASK 3:

DRAW-A-DRONE

(COMPUTING LINKS - EVALUATING TECHNOLOGY / DESIGN TECHNOLOGY - DESIGNING AND EVALUATION)

Another common feature of smart cities, especially when they are being improved, is drones. Can you spot the survey drone in the Smart Cities Exploration Poster? (Hint: the answer to Question 7 might help!) Drones, or UAVs (unmanned aerial vehicles) are used by surveyors and engineers to measure the earth's surface from the sky. They can be fitted with LiDAR scanners, photography equipment or video cameras, so that they can take measurements from above. This provides a new and useful perspective that helps in the analysis of areas which might be difficult to access, such as mountains, forests, bridges, and - you guessed it - busy cities! The fastest drones in the world - like the DRL Racer X - can go from zero to 90mph in under a second, and some drones can reach speeds of over 160mph! The strongest UAVs, such as the Griff 300, can carry up to 500lbs of weight - as much as a full-grown grizzly bear!

Companies like Amazon are already testing out drones as a way to deliver orders to customers. Not only that, these drones will be autonomous - meaning they won't need a human pilot. They'll use satellite navigation, as well as information from visual, thermal and ultrasonic sensors. For this task, imagine what the drone of the near future will look like. Combine the speed of the DRL Racer X and the strength of the Griff 300 to design the ultimate delivery drone - the drone that will make your delivery business the best of them all!

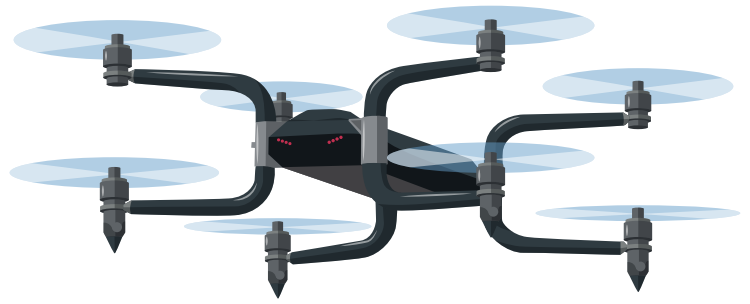


TASK 5:

IT'S BUSINESS TIME

(LITERACY LINKS - PERSUASIVE WRITING / COMPUTING LINKS - MEDIA PRODUCTION)

You've got the design, you've got the performance - now it's time to let everyone in the smart city know that your drone delivery company is open for business! Create an advert that could be projected onto skyscrapers and beamed into smart glasses. Come up with a name for your company, and use your best persuasive language skills to advertise the speed and reliability of the super drones that will whisk orders to customers in record time; you could include the examples you worked out in Task 4! Use what you have learned in the previous tasks about smart cities, fast data connections, and the devices of the near future to convince customers that your drones will deliver at speed, on time, safely, and in style!



TASK 4:

FLIGHT COMMANDER

(GEOGRAPHY OBJECTIVES - LOCATIONAL KNOWLEDGE & GEOGRAPHICAL KNOWLEDGE AND FIELDWORK / MATHS LINKS - USE OF SIMPLE FORMULAE)

The ultimate drone that you have designed has a top speed of 160mph, and can carry just about anything that your average customer might order. To really impress, work out some speedy delivery times using an online map site. Decide on a base for your business (this could be a nearby mail depot, an airport, an industrial estate, or even your own house!), then pick five delivery targets. Find out the distance from the base to the target using the map site, then use this formula to work out how long it would take your drone to deliver a package to the target:

$$\text{TIME} = \text{DISTANCE} \div \text{SPEED}$$

Here's an example to help:

My base is Manchester Airport, and my customer is staying in the Shard building in London, a distance of 157 miles as the crow flies. The top speed of my super drone is 160mph. So, $157 \text{ miles} \div 160 \text{ mph} = 0.98125 \text{ h}$, or 58 minutes, 53 seconds!

As a final challenge, work out how long it would take your super-powered drone to reach the northernmost and southernmost points of your country!

