

What's happening in orbit?

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Hello, and thank you for letting me be a part of your STEM Clubs week! I hope your students will find the video I have made exciting and engaging. To help make the most of the video, and give you options to extend the activity, I am including some notes to accompany the video, as well as some additional resources. I hope you will find these helpful.

Time	Note	Resources
00:30	I mention here that I work as a Lecturer at the University of Manchester. Depending on the age group, this could be an opportunity to explain what a University is, but it's important to note that going to University is not the only way to become an engineer – apprenticeships are a really great option for people who may be more hands-on and like learning by doing.	Spacecareers.uk have lots of great resources aimed at school students that explain different jobs in the space sector, and different options for higher/further education and training. https://spacecareers.uk/?p=school
02:25	I ask the students to guess how many spacecraft are orbiting our Earth right now. I wait (in the video) for about 7 seconds – but feel free to pause here to give the students longer.	Since I put the information together for this video, the number of spacecraft in orbit has actually increased to over 4000! You can see the most reliable up to date numbers at the website of the Union of Concerned Scientists https://www.ucsusa.org/resources/satellite-database
03:24	The video I use here is from a website called Celestrak which tracks all of the spacecraft currently in orbit and allows us to see where they are.	https://celestrak.com/ If you click on the big blue button that says “Launch orbit visualisation” you’ll be taken to an interactive page that shows all the spacecraft currently being tracked in orbit. If you click the three lines in the top left corner you can choose “Satellite catalogue” to search for a satellite (the satellite with my name on it is UKUBE-1, if you want something to search for) and click the “+” on the left to see its orbit. Or you can click a dot on the screen to see what satellite it is. Since I made the video they’ve changed the interface so visualising the spacecraft from the ground is now a bit difficult, so I’m not including instructions for that here.
04:59	Here I ask the students to guess what animals they can see in the image. I pause for 6 seconds, but you may want to pause for longer.	This image was taken by Maxar’s WorldView-3 spacecraft. More info: https://blog.maxar.com/earth-intelligence/2021/maxars-high-resolution-imagery-and-geohive-platform-support-walrus-survey-for-british-antarctic-survey-and-world-wildlife-fund-uk

05:31	Here I ask the students to guess what animals they can see in the image. I pause for 6 seconds, but you may want to pause for longer.	This image was taken by Maxar's WorldView-3 spacecraft. More info: https://blog.maxar.com/earth-intelligence/2017/counting-whales-by-satellite
06:06	Here I ask the students to guess what animals they can see in the image. I pause for 10 seconds, but you may want to pause for longer.	Learn more from the British Antarctic Survey here: https://www.bas.ac.uk/project/wildlife-from-space/
06:53	A longer version of this video is available online. Try searching on Google for "Animals from Above – Google Earth"	Or use this link .
08:32	I ask the students to calculate how many spacecraft they would need to take one picture of an animal every day, if they know that 1 spacecraft can take 1 picture each week. You might want to pause and let them have a go – I then try and explain in simple terms how I would do it but this could be a good opportunity to link into multiplication or addition.	
09:35	Here I move onto the second thing we can do from space, so this might be a good place for a break , if you think the students need one.	More information on fighting piracy using satellites here: https://earthi.space/blog/satellites-prevent-maritime-piracy/
12:29	I ask the students to calculate how many spacecraft they would need to pass a signal 1000km if they know that each spacecraft can send a signal 100km. You might want to pause and let them have a go – I then try and explain in simple terms how I would do it but this could be a good opportunity to link into division or addition.	
	For more resources around STEM and Engineering I recommend checking out the IET resources	https://education.theiet.org/