

Frequently Asked Questions

What is a CubeSat?

A CubeSat is a small satellite that fits in a standardized form factor. This standard allows many CubeSats to be launched from a single mission either as a primary or secondary payload. CubeSats are made of cubic units of 10x10x10cm each. Multiple-unit CubeSats are simply made of multiple of these cubes attached together. The Project DaVinci CubeSat is 3u in size. More than 800 CubeSats have been launched since 1999.

What altitude does the satellite orbit at?

The Project DaVinci CubeSat has a circular orbit 500 km above the ground (310 miles). As the satellite is dragged down by small amounts of high-altitude air, its orbital altitude will decrease until it re-enters the thick atmosphere and is vaporized. For reference, the ISS orbits at 408 km or 254 mi.

How long will the satellite be operating/orbiting/up?

Our CubeSat will stay in orbit for no more than two years. Assuming the batteries hold out, the satellite will continue its educational goal until the high-altitude gases slow it down and vaporize it.

How fast is the satellite be travelling?

The CubeSat is circling the Earth at almost 7.7 kilometers each second! That is about 17,000 miles per hour! At that speed, the satellite will circle the Earth every 95 minutes.

How big is the satellite?

The CubeSat is made of 3 cubes known as "Units". Since one unit is 4x in or 10x cm in size, the complete DaVinci CubeSat is 4x4x12in or 10x10x30cm. This is about the size of a loaf of bread.

Can I receive messages from the CubeSat? / How can I receive messages?

Anyone with a basic radio receiver kit can receive and decode Morse code messages from our satellite. We have resources for helping people choose and setup a kit on our website and YouTube. If you follow our guides, you should be able to connect to our satellite for about 40-100USD of hardware.

What messages does the CubeSat send?

Our satellite sends looping messages in Morse code that can be seen or heard as long and short tones through a receiver kit. These messages are generally STEM inspired or include short code-words that schools can submit to our social media. Schools that successfully receive messages will get announced on our social media.

Where does the satellite travel over?

The DaVinci CubeSat has an orbital inclination of 85 degrees. This means it travels within transmission range of everywhere on Earth each day. Since it orbits every 95 minutes, it may come within range of any location multiple times in a day.

Where was the launch? How many other satellites were launched? And other launch questions.

The CubeSat launched as part of the ELaNa XIX Mission on an Electron rocket made by Rocket Lab. The launch occurred on December 16, 2018. Accompanying it were nine other CubeSats from prestigious universities and laboratories. The rocket launched from Rocket Lab's launch site in New Zealand.

How do schools participate? What benefits does a school get by participating?

Schools can sign up with Project DaVinci on our website. This will keep them updated about our project and provide them with information on how to decode messages sent by the satellite. They will simply need to purchase or make a small radio receiver kit for around \$40.00 (USD).

What is the educational goal of the project?

Our goal with Project DaVinci is to inspire students worldwide to pursue careers in STEM fields. We hope to share the fascination we have with space with other students. As students participate in our lesson plans and receiver kit challenges, they will be able to learn about various science subjects including spacecraft, radio communication, and celestial bodies.

What lesson plans are you sharing with other schools?

Schools that register on our website will have access to a wide variety of short lesson plans for students at all levels. These lessons cover topics like Morse code, comet composition, and basic orbital sciences with most containing a hands on activity. Older students will be able to use information from many of these to receive and decode messages transmitted from our satellite and others.

What is a Project DaVinci space ambassador? How can I become one?

Space ambassadors are our points of contact with schools from across the world. They are individuals who, like us, are interested in space and want to participate in our project. Space ambassadors can stay updated with Project DaVinci to help set up lessons and receiver times at their school. For example, a space ambassador could start a group of students who want to receive messages from the DaVinci CubeSat.

Anyone can become a space ambassador by registering on our website www.projectdavincicubesat.org. Although most space ambassadors register as a school to help students assemble receiver kits, you can sign up as an individual if you just want to receive messages on your own.

I am teacher and I don't know anything about rockets or space. How easy this is to do? How does fit with my curriculum?

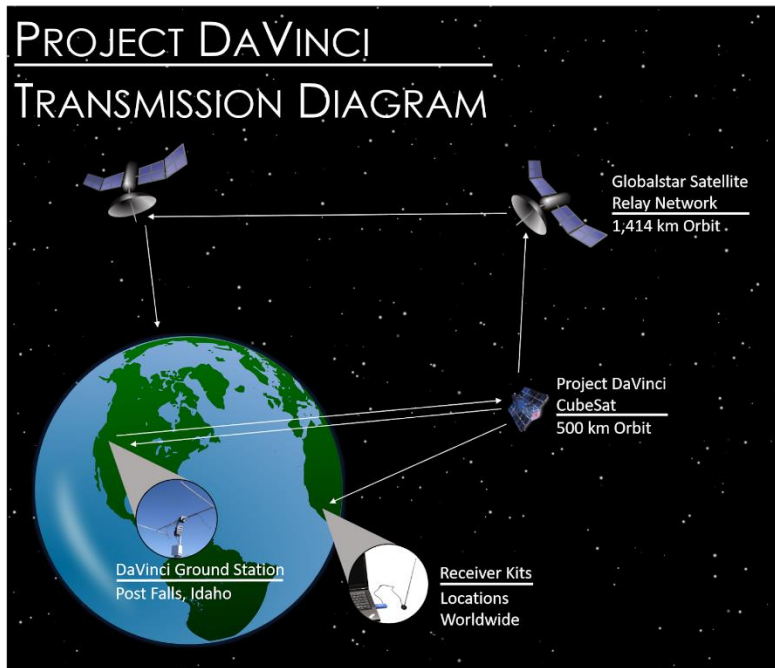
Our lesson plans cover everything you need to know to participate in our project. As we want to get as many people interested in space as possible, we have done our best to make everything understandable by anyone. Although receiving and decoding a message from a satellite can sound daunting, we have made many tutorials and are open with questions. Our lesson plans fit with a wide range of topics even outside of space with some covering the history of morse code and space exploration. Our lessons are aligned to both NGSS and CCS.

What are the capabilities of the DaVinci CubeSat?

Our CubeSat can send Morse code messages, connect with the Globalstar system for internet in space, store data in a virtual time capsule, send messages around the world, take pictures from orbit, and perform Bitcoin transactions.

How does the satellite communicate with the ground?

The DaVinci CubeSat communicates up and down with our ground station, transmits messages for receiver kits, and links to the Internet using GlobalStar relay satellites.



What does a ground station do?

While a receiver kit that a space ambassador would use simply converts transmissions into Morse code messages, we must have a much more powerful radio set that is known as a ground station. To change the message sent by the satellite, we will need to be able to send messages to up as well as receiving them. To accomplish this, we will have two, ten-foot-long antennae that can swivel 360 degrees as well as point at any angle upward. This will allow us to track the satellite and get clearer messages.

What is the Cubesat Launch Initiative?

In 2010, NASA announced a plan to let nonprofits and educational institutions apply to have a CubeSat launched into space. So far, this initiative has put 46 CubeSats into orbit in 12 different missions. The launch series is "ELaNa" for Educational Launches of Nanosatellites. Our launch will be the first one by Rocket Lab.

What happens at the end of the satellite's lifetime?

The Project DaVinci CubeSat was designed for an operating period of two years. After this time, which is determined by how long the batteries continue functioning, it will slowly sink towards the Earth before violently re-entering the atmosphere around 2-4 years after launch. Because of its small size, it will not survive reentry. To make sure no parts make it to the ground, it has been designed to vaporize completely in the intense reentry heat.

What is Rocket Lab?

Rocket Lab is a space company that supplies launches into orbit for small payloads. While large companies like SpaceX hope to get humans back into space, Rocket Lab is focusing on making low-cost launches of satellites into space a routine operation. The ELaNa XIX launch that the DaVinci CubeSat will travel on will be the first business flight by Rocket Lab. Rocket Lab states on their website that they hope to eventually do 200 launches a year.

How much information can the virtual time capsule hold?

The time capsule has a one gigabyte capacity.