

Frequently Asked Questions (FAQs) on WCRC

1. Does the Country need to have Certified Engineers or Equivalent Space/Airworthiness boards to Host the Rocketry Challenge? They are under the Scope of ITAR Legislation?
Wherever, restrictions are there and rules of the respective countries need to be respected. Alternatively, Drones/Balloons can be used for Launching CanSats. If required launch supports will be provided from WCRC Global Secretariat.
2. As a host of one event may I use Mission Design, Simulators or other digital platforms to teach the Webinar of Phase 0?
Sure. Most welcome. You can; every host country can have their own ways of promotions and Webinars/Seminars etc as per their convenience.
3. If there is the possibility of holding the competition at the local level, do you have any way of institutionally supporting the customs exemption or authorization process?
Sure. All possible help and assistance in necessary documentation will be supported by WCRC Global Secretariat.
4. Does the National Qualification competition is allowed to give prizes to their participants?
Yes. Prizes and Awards as per the convenience of local host can be done. Host can meet all the expenses of the event through Registration Fees from participants and local Sponsorships. If any surplus of funds after the event can also be retained by the host themselves for their future activities!
5. All the events, Regulation, and Communication means are in English?
Local host of every nation can translate it in local language(s) as per the requirements of host country.
6. How can I support WCRC in tutoring, teaching directly at the continental or world finals.
Top 5 Teams of every National/Continental Teams can be sent to World Finals. Based on the domain expertise, every host of National/Continental Event will be invited to World Finals and can be served in Jury Boards etc.
7. If I organize an event I will be able to create my Mission Statement's or I can count on the WCRC.
Either way: You can follow the general rules and guidelines laid down by WCRC and also can be modified based on the local/National requirements as much as possible for encouraging more number of participants (based on the maturity level or ecosystem of respective country).
8. Does the Mission Design contemplate the Aerospace Project Management or Only the System Engineering?
Both!
9. For host without Rocketry Capabilities or authorizations can Billons, Drones or Airplanes be an Alternative?
Sure. Alternatives (Drone/Balloon) can be used than Rockets.
10. Do you have a Kick Start Kit for the Rocketry or CanSats or CubeSats?
*Yes. We have many variants of Kick Start Kits for both CanSats/CubeSats and Rockets. Cost Effective Kits to Expensive Kits available. Based on the budget availability and affordability optimum kits can be provided. Even rental options also can be worked out. The bottom line and motto of WCRC is to make every small country and Academic Institutions can afford to explore space and can able to access the Space Technology in a more frugal way. We will provide all necessary supports to genuinely interested countries and institutions.
*Kindly share your profile with your background experience and positions, if employed.**

11. I am a school student (Class 10), very much interested and passionate about space projects and keen to participate in the CanSat Competition. But I do not have any formal qualification and knowledge to build CanSats. I am also keen to learn and participate. Where can I get it trained? How long the training is required? How much will it cost for such training?

We are happy to note your interest and passion for space projects. If anyone has passion for learning can easily pick up the basic concepts quickly through self-learning with the assistance of WCRC and good amount of open learning solutions (YouTube Videos, Free Online Courses) are available. WCRC's Partner Organisation TSC will conduct Workshops (online/offline) regularly. Self-learning of fundamentals of basic electronics and understanding of systems and subsystems of CanSat will normally takes 2-4 Weeks for science students. Diploma/Degree level Engineering Students can able to understand 10-15 days of serious interactions. Online based Self-study will not cost anything. Kindly check the cost of registration fees for Hands on workshops or hybrid workshops (Hands-on, Online and offline).

12. Where can I buy CanSats/CubeSats or Kits (Major Systems and Subsystems)? How much it cost?

TSC Pvt Ltd, India sells CanSats (<https://www.tsctech.in/>) Kits, CanSat Systems and Subsystems. They have 3 models of CanSats/CubeSats based on the nature of competitions and class room learning environment. It ranges from USD 200 (180 Euro) to USD 500 (450 Euro).

The CanSat Kit is compliant with the WCRC Standard and teams can use the same Kit at all phases of the Championship and every year.

13. We are small group (5-10) of engineering students keen to participate in CanSat Competition; we have learnt some basics about CanSats/CubeSats on our own and have few ideas on payloads to be experimented. However, we do not have enough money to spend on building CanSat/CubeSat. Can we get any financial assistance/grants or funding from WCRC to build CanSat/CubeSat?

The primary objective of conducting WCRC is to create and sustain interest among space enthusiasts and passionate students! Also to provide an opportunity for less privileged small nations/institutions to have their own space related activities and eventually helping them to create and ecosystem to access the low earth orbit with their own small satellites! Budget and non-availability of financial resources cannot stop your ambitions or passion. WCRC will provide CanSats/CubeSats (sharing for the competition) for less privileged teams/groups at free of cost. You can bring your "payload" to the venue, one day before the Competition and integrate the same with CanSats/CubeSats for your participation. Those who wish to avail these services can write directly to the organisers of National/Continental/World CanSat/Rocketry Competitions and can participate it. WCRC also provide "research grants" to students' teams/institutions for developing "innovative ideas/payloads" for CanSats/CubeSats! Separate Competitions for funding also will be announced periodically in WCRC Website.

14. We are students from different schools/colleges and wish to participate as team in WCRC. Is it permitted? Can we participate together as a team?

Yes. You can create a team from different institutions as per the minimum numbers. If you have more than the required numbers, multiple teams can be formed and compete in WCRC!

15. What is "Class Room Satellite"? Where can we buy it? How much will it cost?

"Class Room Satellite" is simulated functional model of orbiting satellite in space. It is fully functional nanosatellite designed for teaching spacecraft systems engineering in the classroom and laboratory. It demonstrates six traditional satellite subsystems of a satellite bus: Structural, Electrical Power (EPS), Data Handling (DH), Telemetry Systems/Communications (Comm), Attitude Determination and Control (ADCS), and Thermal subsystems. CanSat/CubeSat as "Class Room Satellite" has been designed and developed by TSC, India and CSPD, Serbia!

16. Do you CanSat/CubeSat Workshop for students at our school/engineering institutions?

Yes. Our motive is to enable anyone and everyone to be able to participate in this event. If any help is needed, our partners at TSC technologies will provide you with CanSat Kits and training for developing your own CanSats.

17. Do you have any specific engagement model of your services and/access to eminent scientists to realise our dream of sending NanoSatellites (CubeSat/UNITYsat/PocketQube) in a cost effect way to LEO?

Yes. Kindly read about UNITY program for more details in FAQs

18. Do you help us to setup our lab or fabricating facilities to promote NanoSatellites activities at our Schools/Institutions/colleges/universities?

Yes. Our resources will be made available for those who require it. We can help you do this through our partners at TSC technologies and UNISEC who can provide expert advice in the setup of your labs.

19. We are interested to participate in WCRC and we are from a very small (tiny) country. Is there any financial assistance for our CanSat/CubeSat, International Travel, Accommodation and Registration Fees?

Yes. WCRC is in the process of mobilisation of Sponsorships and deserving teams will be provided with financial supports and discounted coupons etc. Contact the WCRC Secretariat with specific request and for more details.

20. Do you provide Internships/Mentorships on building CanSats/CubeSats/GCS etc?

Yes. Through our partners at TSC Technologies, we can provide the required mentoring required for CanSat/CubeSat/Ground Control Station development.

21. Do you provide Guidance/Mentorships for our Mini Projects/Academic Projects etc?

Yes. Our partners at Geekspace Inc can provide help with this matter.

22. Do you provide opportunities for schools/colleges/universities to Collaborate with WCRC and its Associated International Partners (Space Industries/Labs/Scientists) to conduct events such as Conferences/Seminars/Symposia/Hackathons/Competitions (Regional/University Level/ National or International Level etc) on New Space Era/Space 2.0/CanSats/CubeSats etc?

Yes. We can help you conduct any of these events (or any other type of event) through our global network of international partners.

23. Do you provide Guidance/Mentorships for launching our own nanosatellite (CubeSat)?

Yes. We have expert partners who have been working in the space field for a long time and can significantly provide all types of assistance for launching your own Nanosatellite.

24. If we wish to launch our own CubeSat, how much money is required? How long will it take?

The Cost of Launch and Launch Schedule varies among Service Providers across the World. Shared raids will have flexible pricing as secondary payloads! Look for Announcement of Opportunities from Launch Service Providers. The prevailing Launch Cost as per NSIL for PSLV Launch Service price would be @ 20,000 Euros/kg and Cost of 3U Deployer provided by ISRO would be additionally charged. Cost of 1 Flight unit of 3U deployer would be: 25,000 Euros.

25. What is qualification/certification of our nanosatellite/CubeSat before launching to space? Where can we get it certified?

The space qualification tests required by the CubeSat Design Specifications are random vibration and thermal vacuum. The random vibration testing levels are provided by the launch integrator or use NASA GSFC-STD-7000 acceptance levels. Certified private facilities are also available. Launch providers will specify the requirements as applicable to their launch vehicles!

26. What are COTS components? What are "MIL Grade" and "Space Grade" components?

COTS specify components that are available as Commercially Off The Shelf. This implies that the components used are available in the market for normal commercial use. MIL Grade defines components that are typically designed to withstand the harsh environment of the battlefield in

military application. Similarly, Space grade components are designed to survive the difficulties of space travel and the various dangers the component may face in space.

27. What are “heritage” systems or components?

Heritage systems or components refer to things that have withstood the test of time in outer space environment and/or terrestrial environment based on the application of the system.

28. What is single event upset in space programme? Why it is an important factor in satellite design and selecting components/systems/sub-systems?

A single-event upset (SEU) is a change of state caused by one single ionizing particle (ions, electrons, photons...) striking a sensitive node in a micro-electronic device, such as in a microprocessor, semiconductor memory, or power transistors. The state change is a result of the free charge created by ionization in or close to an important node of a logic element (e.g. memory "bit"). The error in device output or operation caused as a result of the strike is called an SEU or a soft error.

The SEU itself is not considered permanently damaging to the transistor's or circuits' functionality unlike the case of single-event latch-up (SEL), single-event gate rupture (SEGR), or single-event burnout (SEB). These are all examples of a general class of radiation effects in electronic devices called single-event effects (SEEs).

29. What is payload? What is LEO, MEO, SSO and GEO?

Payload refers to the main research aspect of the satellite. It is the part of the satellite that is responsible for performing the mission of the satellite. The typical applications of CubeSats are mostly in Low-Earth Orbit (LEO), Medium-Earth Orbit (MEO), Sun-Synchronous Orbit (SSO) and GEO (Geo-Synchronous orbit). LEO is defined as the region below 2000km above sea level. MEO is the region between LEO and GEO (between 2000km to 35786 km above sea level). GEO is an orbit located at 35786km above sea level that allows the satellite to maintain the same orbital period as Earth. If the orbit is on the same plane as the equator, it is called the geostationary orbit. SSO, also called a heliosynchronous orbit, is a nearly polar orbit around a planet, in which the satellite passes over any given point of the planet's surface at the same local mean solar time. More technically, it is an orbit arranged so that it processes through one complete revolution each year, so it always maintains the same relationship with the Sun.

30. What is Deorbiting? Why it is important? What is debris management in space?

Deorbiting refers to removing a satellite from orbit. This is mainly done at the end of the mission duration of the satellite to prevent it contributing to space junk. Debris management is really important, especially in LEO, as the satellites are moving at a speed of around 8km/s. If any part of the old satellite collides with other satellite. It can cause huge damage even if the part is just a small screw or a broken piece of plastic. It can severely impact other satellites and missions that are still functioning causing severe after-effects.

31. Do you provide any “Course Materials” or “Text Books” or “Self-Learning Resources” for a beginner in space programme (CanSats/CubeSats) or team wish to participate in WCRC?

Yes, we are preparing online lectures and resources aimed at helping students / non-professionals understand the working, design process and functionality of CanSats. These resources will be made available soon.

32. We are interested to organize Regional/National CanSat Competition. How to go about it?

You can organize Regional/National CanSat Competitions under WCRC. For more details, get in contact with us. Our Contact information is available under “Contact Us” page in www.wcrc.world

33. What kinds of support as a host, we can expect from WCRC, if we wish to host Regional/National/Continental CanSat Competitions?

Providing the Rules, Regulations, Jury Panel, Training for Interested Teams/Institutions in design and development of CanSat, Payloads etc. Assistance to conducting the event including Rocket/Drone Launch Support Services etc will be provided from WCRC Secretariat!

34. Is there any minimum numbers of teams to be participated in Regional/National CanSat Competitions? How to create interest or to ensure the participation of more teams?
10-20 Teams based on the size of the Country/Region and numbers of Technical Institutions/universities etc. Exemptions can be given and any specific region/national peculiarities can be discussed and realistic decisions can be taken based on case to case!
35. How can we make this CanSat Competition more inclusive and provide opportunities for various Institutions across India, such large country (*nation of many nationalities*) with diversities/unequal growth etc?
In India, it is advisable to have Multi-layer Competitions, based on State wise/Regional wise/Intra-Regions/Zonal wise/Inter Zone/National etc by selecting top 3/5/8 Teams etc as per numbers of entries of teams at each level. Then Top 5/8/10 Teams can compete in Continental/International WCRC! There is a possibility of accommodating one or two teams under special conditions to participate in WCRC directly as wild card entry! However, all such teams will be under one pool and then compete with selected teams from Continental/National Competitions during the final WCRC!
36. Can we organize institutional Level/City Level CanSat Competitions? How can we proceed?
Yes, you can organize institutional Level/City level CanSat Competitions under WCRC. For more details, get in contact with us. Our Contact information is available under "Contact us" page in www.wcrc.world
37. Can we organize On-line CanSat Workshops? If so, what kind of support can we expect from WCRC? What are the terms?
WCRC in partnership with TSC is preparing material for an On-line CanSat Course. The course material will be made available shortly. For more details, contact the WCRC / TSC Team.
38. Can we organize Webinar on CanSat/CubeSat? If so, what kind supports, we will get it from WCRC? What are the terms?
If you wish to organize a Webinar on CanSat/CubeSat, WCRC can provide you with resource persons and help you with spreading awareness of the webinar across an international audience.
39. Can we organize University Level/Inter-University Level CanSat Competitions? How can we proceed?
Yes, you can organize University Level/Inter-University level CanSat Competitions under WCRC. For more details, get in contact with us. Our Contact information is available under "Contact us" page in www.wcrc.world
40. For the Launch of CanSat/Cube Sat with Rockets during Competition, does it require any special permission? If so, where can we get it?
CanSats can be launched by numerous methods, 3 of the most popular methods are weather balloons, drones and rockets. Weather balloons and rockets require prior permission from suitable legal authorities from the respective country, for example, in India AAI (Airports Authority of India) needs to provide prior permission to such activity. For drones, depending on the country, rules may vary; most countries allow low altitude operation of drones within educational institutions.
41. How much will it cost for Rocket Launch, Drone Launch, and Balloon Launch of CanSat/CubeSat? How much height is permitted or reasonable for the Competitions?
Less than 200-300 feet (line of site) are advised; however, based on the host country/city statutory permissions, approvals and rules/regulations need to be followed. Cost varies for rocket/Drone/Balloon Launch. Based on the numbers of the teams, location of the country/continent cost can be optimized.
42. Who will provide the services of Rocket Launch, Drone Launch, and Balloon Launch of CanSat/CubeSat? How much will it cost?
If the host has access to launch services are free to do on their own/vendor. WCRC will provide assistance in identifying the service providers. Cost varies for rocket/Drone/Balloon Launch. Based on the numbers of the teams, location of the country/continent cost can be optimized.
43. Where can we get different types of parachutes for CanSats/CubeSats? How much will it cost?

Parachutes are easier made than bought. Nevertheless, Parachutes can be found on various e-commerce stores such as Amazon/Aliexpress. TSC will also make parachutes rated for ideal decent rate of the standard CanSat and make it available for purchase on their website.

44. How to design our own parachute for CanSat/CubeSat? How to calculate the descend rate?
Try using online calculation tools (<https://descentratecalculator.onlinetesting.net/>). Plenty of similar calculators are available online and can be used to calculate the descent rate. Also, there are plenty of videos available on YouTube on parachute design.
45. Can we make our own rocket for launching CanSat? What are safety precautions to be taken?
It is possible to make your own rocket to launch CanSats. Although, it is not suggested that you don't try making your own rockets unless you have prior experience with rocketry as rockets can pose to be a serious fire/explosion hazard.
46. If we make our own rocket for launching CanSat, does it require any permission from any authority?
Yes, all rockets being launched above 200 feet in altitude (Varies based on country) require prior permission from suitable legal authorities.
47. Can we organize CanSats/CubeSats Competitions for School Students alone?
Yes. You can, WCRC will assist the entire process of design and development of CanSat by handholding the host!
48. Whether school students can be part of the WCRC competitions' team members?
Yes. They can.
49. Can we have team members from different institutions/cities within the same country?
Yes. There can be heterogeneous Institutions form a team and compete in WCRC.
50. Can we have team members from different countries within the same continent?
Yes. There can be heterogeneous Countries can form a team and compete in WCRC as a representative team if no other country from that continent is representing WCRC.