



Vocabulary

2024 Terms and definitions.

Adviser: A person at least 18 years old who monitors safety, acts as a mentor and who may provide things like transportation and snacks. We recommend one adviser per team and your adviser shouldn't give you all the answers or do the project for you.

Asteroid: Any of numerous small solar system bodies that revolve around the sun, with orbits lying chiefly between Mars and Jupiter and characteristic diameters roughly between one and several hundred kilometers.

Brainstorming: Coming up with ideas — sometimes crazy ones — for a solution to a problem. It's possible to brainstorm on your own, but most find it works best as a team activity.

Chemical reaction: A process in which one or more substances are changed into others. Chemical reactions are not allowed in this year's challenge.

Compressed air: Air held under pressure in a container: the force generated when the air is released is used to operate machines, tools, etc. For the Tech Challenge, we limit the amount of pressure allowed from compressed air to 5 psi (pounds per square inch).

Constraints: A control or limit to a design. For example, a constraint might be that your device can't weigh more than 3 pounds.

Design: The creation of a plan for the construction of your device. Sometimes used to refer to the device itself.

Device: The gizmo you and your team are designing, engineering and building for The Tech Challenge.

Dimension: A dimension is a measurement such as length, width, or height. If you talk about the dimensions of an object or place, you are referring to its size and proportions.

Engineer: A person who designs, constructs and tests devices, materials and systems while considering constraints caused by safety, practicality, rules and cost.

Engineering analysis: Looking at a problem using scientific analytic principles and processes so you can see the properties of what you are designing. To start, break down a problem into its basic parts to look at relationships between its pieces and things other than your device.

Engineering journal: A record of all the brainstorming, research, prototyping and other work that goes into developing your team's device.



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Failure: Sometimes you feel this when your device doesn't work, but a big part of engineering is finding failure points and fixing them. So running into a roadblock with your device is an opportunity to use your engineering brain to make your device even better.

Failure point: When a break in a system causes a device to work improperly or not work at all. One of the jobs of an engineer is to find failure points so they can fix them, and it's one of the reasons we test again and again.

Final design: The final plan for the construction of your device, agreed upon by the whole team. The team develops the final plan after brainstorming, prototyping and testing again and again. Sometimes this term is used instead of Final Device.

Final device: The device your team will bring to the showcase — the product of all your team's brainstorming, designing, prototyping, testing and re-testing.

Friction: When one object rubs against another, it creates friction. What happens when you and another person try to go through a door at the same time? You probably bump up against each other, causing friction, which makes it difficult for either of you to get through the door.

Gravity: The force that brings any two objects together, e.g. you and the Earth. See also Weight.

Human Power: Power available from or supplied by the physical effort of human beings.

Innovator: Someone who creates something new or makes changes to something that already exists in order to meet a specific need. For example, you and your team as you design, engineer and build a device to survive a drop and travel some distance without using batteries.

Iteration: The different versions of the device you build as it changes due to the Engineering Design Process.

Landing: The act of coming to land after a voyage.

Launch: To propel with force.

Launch Platform: A platform from which a rocket or launch vehicle can be launched. For this year's Tech Challenge, the launch platform is where you will place your launcher.

Launcher: A device that launches aircraft, rockets, and satellites. For the 2024 Tech Challenge, teams must bring their own launcher.

Living document: A document that is continually being updated. For example, your engineering journal.



Momentum: A measurement of mass in motion. Any object in motion has momentum.

Moon: A natural satellite of a planet.

Nominal: Approximate; that is, there may be minor variances between the measurements stated in the rules and drawings and the actual test rig, for example.

Payload: The payload of an aircraft or spacecraft is the amount or weight of things or people that it is carrying. For the 2024 Tech Challenge, your payload will be the tennis balls you launch from your launcher.

Perseverance: Not giving up in the face of failure. Your team may experience setbacks, but it doesn't have to give up. Getting past those failures can be fun and rewarding.

Pit: The area where, during the showcase in April, you and your team will make your final preparations before judging.

Planet: Any of the large bodies that revolve around the sun in the solar system or a similar body associated with another star.

Prototype: A first and usually functional form of a new type or design of a construction. As part of The Tech Challenge, teams will iterate and improve their prototypes until they find a final solution.

Repeatability: The ability of your device to demonstrate the same results under the same conditions, i.e. to work every time you test it.

Retrieve: To get and bring back. For safety reasons, teams cannot retrieve their payloads during the 2024 Tech Challenge.

Safety: Your No. 1 priority! Safety involves using tools correctly, wearing goggles when working on and testing your device, and more. While your team should appoint a safety monitor, everyone on the team is responsible for safety!

Solution: The design your team builds for The Tech Challenge.

Specifications: Detailed descriptions of design criteria for a piece of work.

Spirit of the Challenge: The Tech Challenge emphasizes the importance of engineering solutions that would be practical in real life. Test rigs involve small-scale representations of real-world conditions. Teams should develop designs that represent real-life solutions.

The Spirit of the Challenge is an important factor in scoring. The best engineering journals document an understanding of real-world factors and contain a detailed explanation of how your



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design might have practical, real-life applications. Teams should expect judges to press them on this issue and will be asked questions such as “How would your design work in real life?” A good explanation of how their design approach is compatible with the Spirit of the Challenge will have a positive influence on the team’s score.

While store-bought solutions are not prohibited, they are not in the Spirit of the Challenge.

Test rig: The thing your team will test its device on. The Tech Challenge designs an official test rig. We also design a simple version you can build so you can test at home or school.

Transfer of Energy: A device that activates or releases or causes something to happen. After device setup, human power may start movement by releasing/pushing/pulling a trigger but not by pushing, pulling or lifting the launch device itself. This is also an important safety factor.

Trigger: A device that activates, releases or causes something to happen. For the 2024 Tech Challenge, it is a built-in release mechanism that starts your launcher. Examples of triggers include: pulling a string, pressing a button, flipping a latch, opening a clip and removing a stick

Velocity: Quickness of motion. Rapidity of movement.

Weight: The amount that a thing weighs. This year's Tech Challenge has a weight limit.

Weight limit: Rule establishing the maximum weight of an object, person, or device.

Sources: Collins Dictionary, Wikipedia, <http://www.engineering-dictionary.org>, Vocabulary.com, Merriam-Webster.com, and American Heritage dictionary