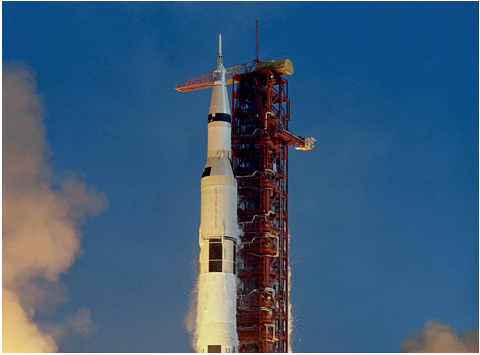







Apollo Saturn V








	Height	● 110.0 m
	Weight	● 2,970,000 Kg
	Diameter	● 10.1 m
	Thrust	● 35,100 kN
	Payload	● 140,000 Kg

Saturn V was an American super heavy-lift launch vehicle certified for human-rating used by NASA between 1967 and 1973. It consisted of three stages, each fueled by liquid propellants. It was developed to support the Apollo program for human exploration of the Moon and was later used to launch Skylab, the first American space station.

SLS System - NASA








	Height	● 111.0 m
	Weight	● 1,600,000 Kg
	Diameter	● 8.4 m
	Thrust	● 32,000 kN
	Payload	● 143,000 Kg

The Space Launch System (SLS) is a super heavy-lift expendable launch vehicle, which has been under development by NASA in the United States since its announcement in 2011. It is the primary launch vehicle of NASA's deep space exploration plans, including the planned crewed lunar flights of the Artemis program and a possible follow-on human mission to Mars.

Black Arrow








	Height	● 13.0 m
	Weight	● 18,130 Kg
	Diameter	● 2.0 m
	Thrust	● 256 kN
	Payload	● 102 Kg

Black Arrow, officially capitalised BLACK ARROW, was a British satellite carrier rocket. Developed during the 1960s, it was used for four launches between 1969 and 1971. Its final flight was the first and only successful orbital launch to be conducted by the United Kingdom, and placed the Prospero satellite into low Earth orbit.

Mercury Redstone








	Height	● 25.0 m
	Weight	● 30,000 Kg
	Diameter	● 1.78 m
	Thrust	● 350 kN
	Payload	● 1,451 Kg

Mercury Redstone,The Mercury-Redstone launch vehicle, designed for NASA's Project Mercury, was the first American crewed space booster. It was used for six sub-orbital Mercury flights from 1960 - 61; culminating with the launch of the first, and eleven weeks later, the second American (and the second and third humans) in space.

Atlas








	Height	● 23.0 m
	Weight	● 117,000 Kg
	Diameter	● 3.0 m
	Thrust	● 1,600 kN
	Payload	● 4,900 Kg

Atlas, is a family of US missiles and space launch vehicles that originated with the SM-65 Atlas. The Atlas intercontinental ballistic missile (ICBM) program was initiated in the late 1950s under the Convair Division of General Dynamics. Atlas was a liquid propellant rocket burning RP-1 fuel with liquid oxygen in three engines configured in an unusual 'stage and a half' or 'parallel' staging design.

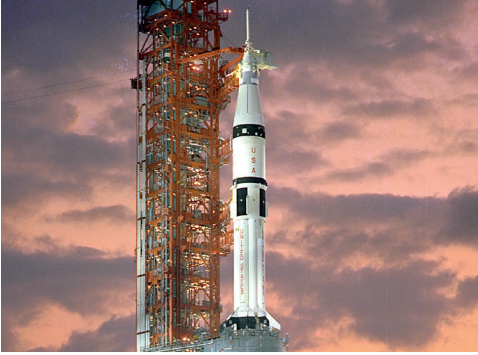
Delta IV








	Height	● 64.0 m
	Weight	● 350,000 Kg
	Diameter	● 5.0 m
	Thrust	● 3,140 kN
	Payload	● 20,000 Kg

Delta IV, is a group of five expendable launch systems in the Delta rocket family introduced in the early 2000s. Originally designed by Boeing Defense, Space and Security division for the Evolved Expendable Launch Vehicle (EELV) program, the Delta IV became a United Launch Alliance (ULA) product in 2006. The Delta IV is primarily a vehicle for United States Air Force military payloads.

Apollo Saturn IB








	Height	● 43.0 m
	Weight	● 590,000 Kg
	Diameter	● 6.0 m
	Thrust	● 890 kN
	Payload	● 48,000 Kg

Saturn IB, also known as the uprated Saturn I was an American launch vehicle commissioned by the National Aeronautics and Space Administration (NASA) for the Apollo program. It replaced the S-IV second stage of the Saturn I with much more powerful S-IVB, able to launch a partially fueled Apollo Command and Service Module (LM) into low earth orbit for early flight tests before the larger Saturn V.

Apollo Saturn I








	Height	● 13.0 m
	Weight	● 18,130 Kg
	Diameter	● 2.0 m
	Thrust	● 256 kN
	Payload	● 102 Kg

Saturn I, The Saturn I was a rocket designed as the United States' first medium lift launch vehicle for up to 20,000-pound (9,100Kg) low Earth orbit payloads. The rocket's first stage was built as a cluster of propellant tanks engineered from older rocket tank designs. Its development was taken over from the Advanced Research Projects Agency in 1958 by the newly-formed civilian NASA.

Ariane 5








	Height	● 52.0 m
	Weight	● 777,000 Kg
	Diameter	● 5.4 m
	Thrust	● 14,000 kN
	Payload	● 7,000 Kg

Ariane 5 is a heavy-lift space launch vehicle developed and operated by Arianespace for the European Space Agency (ESA). It is launched from the Centre Spatial Guyanais in French Guiana. It has been used to deliver payloads into geostationary transfer orbit (GTO) or low Earth orbit (LEO). A direct successor system, Ariane 6 is in development.

Ariane 1








	Height	● 50.0 m
	Weight	● 207,000 Kg
	Diameter	● 3.8 m
	Thrust	● 2,771 kN
	Payload	● 1,850 Kg

Ariane 1 was the first rocket in the Ariane family of expendable launch systems. It was developed and operated by the European Space Agency (ESA), which had been formed in 1973, the same year that development of the launch had commenced. Ariane 1 was the first launcher to be developed with the primary purpose of sending commercial satellites.

Vostok








	Height	● 30.84 m
	Weight	● 43,300 Kg
	Diameter	● 2.9 m
	Thrust	● 971 kN
	Payload	● 4,730 Kg

Vostok was a family of rockets derived from the Soviet R-7 Semyorka ICBM and was designed for the human spaceflight programme. This family of rockets launched the first artificial satellite (Sputnik 1) and the first crewed spacecraft (Vostok) in human history. It was a subset of the R-7 family of rockets.

Soyuz








	Height	● 45.6 m
	Weight	● 308,000 Kg
	Diameter	● 10.3 m
	Thrust	● 838 kN
	Payload	● 6,450 Kg

Soyuz The Mercury-Redstone launch vehicle, designed for NASA's Project Mercury, was the first American crewed space booster. It was used for six sub-orbital Mercury flights from 1960 - 61; culminating with the launch of the first, and eleven weeks later, the second American (and the second and third humans) in space.

Kosmos - 3M








	Height	● 32.0m
	Weight	● 109,000 Kg
	Diameter	● 2.4 m
	Thrust	● 1,485 kN
	Payload	● 1,400 Kg

Kosmos - 3M is a Russian space launch vehicle, member of the Kosmos (rocket family). It is a liquid-fueled two-stage rocket first launched in 1967 and with over 420 successful launches to its name. The Kosmos - 3M uses UDMH fuel and AK271 oxidizer (red fuming nitric acid) to lift roughly 1,400Kg (3000 lb) of payload into orbit.

GSLV Mk III








	Height	● 43.0m
	Weight	● 640,000 Kg
	Diameter	● 4.0 m
	Thrust	● 5,150 kN
	Payload	● 4,000 Kg

Geosynchronous Satellite Launch Vehicle Mk III, also referred to as the Launch Vehicle Mk III is a three-stage medium-lift launch vehicle developed by the Indian Space Research Organisation (ISRO). Primarily designed to launch communication satellites into geostationary orbit. It is also identified as launch vehicle for crewed missions under the Indian Human Spaceflight Programme and dedicated science missions like Chandrayaan - 2.

Long March 3








	Height	● 43.0m
	Weight	● 204,000 Kg
	Diameter	● 3.35 m
	Thrust	● 2,961 kN
	Payload	● 5,000 Kg

Long March 3, also known as the Changzheng 3, CZ-3 and LM-3 was a Chinese orbital carrier rocket design. They were all launched from Launch Area 3 at the Xichang Satellite Launch Center. It was a 3-Stage rocket, and was mostly used to place DFH-2 class comms satellites into geosynchronous transfer orbits. It was complemented and later replaced by the more powerful Long March 3.

Pegasus ALR



	Height	● 16.9m
	Weight	● 18,500 Kg
	Diameter	● 1.27 m
	Thrust	● 486 kN
	Payload	● 443 Kg

Pegasus ALR, is an air-launched rocket developed by Orbital Sciences Corporation and now built and launched by Northrop Grumman. Capable of carrying small payloads of up 443 kilograms into low earth orbit, Pegasus first flew in 1990 and remains active as of 2019. The vehicle consists of three solid propellant stages and an optional monopropellant fourth stage.

Shuttle Rocket



	Height	45.46 m
	Weight	90,718 Kg
	Diameter	3.7 m
	Thrust	12,000 kN
	Payload	90,718 Kg

Space Shuttle Solid Rocket Booster was the first solid-propellant rocket to be used for primary propulsion on a vehide used for human spaceflight and provided the majority of the Sp[ace Shuttle's thrust during the first two minutes of flight. After burnout, they were jettisoned and parachuted into the Atlantic Ocean where they were recovered, refurbished and reused.

Falcon I - SpaceX



	Height	21.0 m
	Weight	28,000 Kg
	Diameter	1.7 m
	Thrust	450 kN
	Payload	670 Kg

Falcon I was an expendable launch system privately developed and manufactured by SpaceX during 2006 - 2009. On September 2008, Falcon I became the first privately-developed liquid-fuel launch vehicle to go into orbit around the Earth.The two stage to orbit rocket used LOX/RP1 for both stages, the first powered by a single Merlin engine and the second pwered by a Kestrel engine.

Falcon 9 - SpaceX



	Height	70.0 m
	Weight	549,000 Kg
	Diameter	3.7 m
	Thrust	256 kN
	Payload	102 Kg

Falcon 9 is a partially reusable two-stage-to-orbit medium-lift launch vehicle designed and manufactured by SpaceX in the United States. It is powered by Merlin-engines, also developed by SpaceX, burning cryogenic liquid oxygen and rocket-grade kerosene (RP-1) as propellants. Its name is derived from the fictional Star Wars spacecraft, the Millenium Falcon, and powered by nine Merlin engines.

Falcon Heavy - SpaceX



	Height	70.0 m
	Weight	1,420,788 Kg
	Diameter	3.7 m
	Thrust	934 kN
	Payload	63,800 Kg

Falcon Heavy is a partially reusable heavy-lift launch vehicle designed and manufactured by SpaceX. It is derived from the Falcon 9 vehicle and consists of a strengthened Falcon 9 first stage as the center core with two additional Falcon 9 like first stages as strap on boosters.The Falcon Heavy has the highest payload capacity of any current operational launch vehicle and the third highest of any rocket.

H-IIB JAXA and Mitsubishi



	Height	32.0m
	Weight	109,000 Kg
	Diameter	2.4 m
	Thrust	1,485 kN
	Payload	1,400 Kg

H-IIB JAXA and Mitsubishi was an expendable space launch system jointly developed by the Japanese government's space agency JAXA and Mitsubishi Heavy Industries. It was used to launch the H-II Transfer Vehicle (HTV or Konotoni) cargo spacecraft for the International Space Station.The H-IIB was a liquid-fueled rocket, with solid fuel strap-on boosters and was launched from Tanegashima.

Energia



	Height	58.7 m
	Weight	2,400,000 Kg
	Diameter	17.65 m
	Thrust	5,800 kN
	Payload	100,000 Kg

Energia was a super heavy lift launch vehicle. It was designed by NPO Energia of Soviet Union for a variety of payloads including Buran spacecraft.. Control system main developer enterprise was the Khartron NPO Electropribor. The Energia used four strap-on boosters each powered by four-chamber RD-170 engine burning kerosene/LOX and a central core stage with 4 one-chamber RD-0120 engines fueled by liquid hydrogen.

V2 Rocket



	Height	14.0 m
	Weight	12,500 Kg
	Diameter	1.65 m
	Thrust	249 kN
	Payload	1,000 Kg

V2 Rocket.The V2 'Retribution Weapon' with the technical name Aggregate was the worlds first long-range guided ballistic missile. The missile, powered by a liquid propellant engine, was developed during the Second World War in Germany as a vengeance weapon assigned to attack Allied cities as retaliation for the first artificial object to travel into space by crossing the Karman line with a vertical launch.

Black Knight



	Height	10.5 m
	Weight	5,750 Kg
	Diameter	0.9m
	Thrust	71 kN
	Payload	115 Kg

Black Knight, was a British research ballistic missile, originally developed to test and verify the design of a re-entry vehicle for the Blue Streak missile. It was the United Kingdom's first indigenous expendable launch project. Design work on what would become Black Knight launch vehicle commenced in 1955, being performed by the Royal Aircraft Establishment and Saunders Roe.

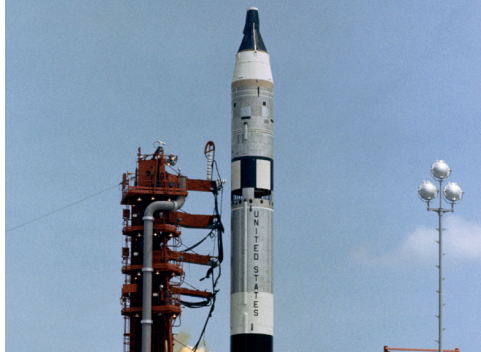
Polaris UGM-27



Height	9.86 m
Weight	16,200 Kg
Diameter	1.3 m
Thrust	667 kN
Payload	90,718 Kg

Polaris UGM-27 missile was a two stage solid-fueled nuclear armed submarine launched ballistic missile rocket.As the United States Navy's first SLBM it served from 1961 to 1996. In the mid -1950s the Navy was involved in the Jupiter missile project with the US Army and had influenced the design by making it squat so it would fit in submarines.

Gemini Titan 2 GLV



Height	33.0 m
Weight	154,220 Kg
Diameter	3.0 m
Thrust	1900 kN
Payload	3583 Kg

Titan II GLV or Gemini-Titan II was an American expendable launch system derived from the Titan II missile, which was used to launch twelve Gemini missions for NASA between 1964 and 1966. The uncrewed launches followed by ten crewed ones were conducted from Launch Complex 19 at the Cape Canaveral Air Force Station starting with Gemini I on April 8, 1964.

Atlas V



Height	58.3 m
Weight	590,000 Kg
Diameter	3.8 m
Thrust	3827 kN
Payload	20,500 Kg

Atlas V is an expendable launch system and the fifth major version in the Atlas rocket family. It was originally designed by Lockheed Martin, now being operated by United Launch Alliance (ULA), a joint venture between Lockheed and Boeing. Each Atlas V rocket consists of two main stages. The first stage powered by a Russian RD-180 engine manufactured by RD Amross, burning kerosene and liquid oxygen.

New Glenn Blue Origin



Height	98.0 m
Weight	45,000 Kg
Diameter	7.0 m
Thrust	17,125 kN
Payload	13,000 Kg

New Glenn named after John Glenn, is a heavy-lift orbital launch vehicle in development by Blue Origin. Design work on the vehicle began in 2012. Illustrations of the vehicle, and the high level specifications, were initially publicly unveiled in September 2016. New Glenn is described as a two-stage rocket with a diameter of 7 metres (23ft). Its first stage will be powered by seven BE-4 engines.

SpaceX Starship



Height	122.0m
Weight	5000,000 Kg
Diameter	9.0 m
Thrust	65,000 kN
Payload	100,000 Kg

SpaceX Spaceship system is a fully-reusable, two-stage-to-orbit, super heavy-lift launch vehicle under development by SpaceX since 2012, as a self-funded private spaceflight project. The second stage - which is also referred to as 'Starship' is being designed as a long-duration cargo, eventually passenger - carrying spacecraft. It is initially without any booster stage at all to test launch and landing.

Vulcan Centaur



Height	61.6 m
Weight	546,700 Kg
Diameter	5.4 m
Thrust	4,900 kN
Payload	27,200 Kg

Vulcan is ULA's first launch vehicle design, adapting and evolving various technologies previously developed for the Atlas and Delta IV rockets of the USAF's EELV program. The first stage propellant tanks share the diameter of the Delta IV Common Booster Core, but will contain liquid methane and liquid oxygen propellants instead of the Delta IV's liquid hydrogen and liquid oxygen.



Air Snapz - Game Rules

- Air Snapz, following the traditional format of Top Trumps and highest score achieved by category selection.
- Maximum of six players per pack of thirty cards.
- To start the game, shuffle and deal all the cards face down.
- Each player holds their cards so that they can see the top card only.
- The player to the dealer's left starts by reading out a category of choice from the top card. (e.g. **Height, Weight, Diameter, Thrust and Payload**).
- The other players then read out the same category from their cards.
- The player with the highest score wins the other participants cards.
- In the event of a draw the cards are placed in the centre and a new category is chosen from the next card by the same person as in the previous round.
- The winner of that round obtains all of the cards in the center as well as the top card from each player.