

Storyboard:

Hello fellow astronauts and welcome to the Nasa Experience.

11 October 1958 marks the first NASA launch ever and the beginning of an extraordinary era full of challenges and discoveries.

We would like to invite you to live this journey with us.

Challenges:

Challenge 1:

Welcome to the Landsat program

“Earth through vision”

Status: Current, Extended Mission

Mission Category: Earth Observing System (EOS)

Lunch Date: July 23rd, 1972

The goal of the program is to gather facts about the natural resources of our planet using imaging satellites. Researchers were able to collect millions of images using this technology, which allowed them to extract various data on insects, crop growth, geology and mineral resources, hydrology and water resources, geography, surveillance...

So far, a total of 9 satellites have been launched; some of them are still active while others are not. Each one had its significant contribution in the research domain and that's either by the generated output or just the learnt lessons from their experiences.

References:

NASA Missions

(https://science.nasa.gov/missions-page?field_division_tid=103&field_phase_tid=All)

NASA History

(<https://history.nasa.gov/40thann/define.htm#:~:text=1958%20Pioneer%20I%3A%20First%20NASA,of%20the%20X%2D1%20series.>)

Let the experience start!!

Missions:

Mission 1: Landsat 1

Status: Not Active

Objective: acquisition of satellite imagery

Lunch Date: July 23rd, 1972 out of the Vandenberg Air Force Base in California.

Orbit : Sun-synchronous orbit

Impact: It worked on transmitting over 100,000 images in the span of 2 years covering more than 75% of the earth surface and over 300,000 images over its lifespan.

Malfunction: The satellite was taken off in January 1978 due to the tape recorder malfunction.

Let's launch our own rocket!!

Quizzes:

When was NASA's first lunar space program launched? (**October 1958**, July 1972, March 1958)

What do we call a person who is trained to travel in a spacecraft? ({b,a,r,n,o,a,u,s,l,t} nine empty blocs _ answer: **Astronaut**)

Mission 2: Landsat 2

Objective: Acquire global, seasonal data in medium resolution from a near-polar, sun-synchronous orbit.

Launch: January 22nd, 1975 on a Delta 2910 out of Vandenberg Air Force Base in California

Orbit: Sun-synchronous, near-polar orbit.

Impact: Landsat 2 transmitted its data to several international ground stations. The ground stations were located on six of the seven continents, with the first beginning operations in April 1975 in [Prince Albert](#), Canada, and the last to begin operations in December 1981 in [Hartebeesthoek](#), South Africa

Malfunction: The satellite continued operations until February 25, 1982, when it was removed from operations due to a faulty yaw control thruster. The satellite was placed in standby mode on March 31, 1983.

This is it for now, you can use the rest as ressources

Landsat3 :

Objective :

providing a global archive of satellite imagery.

managed solely by [NASA](#)

extend the period of space data acquisition for Earth resources by Landsat 1 and Landsat 2.

obtain information on agricultural and forestry resources, geology and mineral resources, hydrology and water resources, geography, cartography, environmental pollution, oceanography and marine resources, and meteorological phenomena.

Launch:

launched from [Vandenberg Air Force Base](#), California on March 5, 1978

Orbit:

It was placed into a sun-synchronous, near polar orbit at an inclination of 99.1 degrees and an altitude of 570 miles (920 km). Landsat 3 completed 14 orbits of the Earth daily, and its cycle repeated every 18 days

Malfunction:

Landsat 3's MSS had five spectral bands, but one failed shortly after launch. The satellite was placed in standby mode on March 31, 1983.^[2] Landsat 3 was decommissioned on September 7, 1983

Result;

Countries used Its data to discover and monitor resources that they would have not been capable of otherwise

, [Bolivia](#) spent \$10,000 on data which was used to discover vast [lithium](#) deposits, while United States companies have invested more than \$136 million for further exploration. [Kenya](#) used the data to monitor grazing conditions and to help [lion](#) and [cheetah](#) preservation efforts, and Pakistan used the data to decide where to dredge the river delta to build a new port.

Methodology:

Specific locations for Landsat 3's data can be found by using the World Reference System (WRS). To find any specific location on Earth, a row and path number are required; for example, Row 60 is at the equator. Landsat 1-3 use WRS-1, but Landsats 4 and after used WRS-2

Landsat4:

Objective:

providing a global archive of satellite imagery

Launched: launched on July 16, 1982, from [Vandenberg Air Force Base](#) in California

Malfunction :

first major malfunction occurred July 27, 1982. The high gain Ku antenna was commanded to deploy but failed. Attempts to free the antenna were successful on August 15

In February 1983, the satellite lost half of its [solar power](#) and the ability to send science data directly to Earth, prompting fears the satellite would fail sooner than expected.^[12] This caused the early launch of [Landsat 5](#)

ended on December 14, 1993, when the satellite lost its ability to transmit science data, far beyond its designed life expectancy of five years

Landsat 4 continued to broadcast telemetry, tracking, and command data, which was transmitted on the still-functional [S-band](#), until the satellite was decommissioned June 15, 2001

Orbits: flew in lower orbits

Advantage: they had a higher field of view (FOV) so they had the same swath widths. The new Landsat spacecraft also featured improved instrumentation.

Landsat 5 :

Objective : collect [imagery](#) of the [surface](#) of [Earth](#).

LAUNCHED : March 1, 1984 from [Vandenberg Air Force Base](#)

it took about 16 days to scan the entire [Earth](#).

The Multi-Spectral Scanner was powered down in 1995,^[4] but reactivated again in 2012

Results:

first satellite to capture the [nuclear accident at Chernobyl](#) in 1986

documented [deforestation](#) occurring in tropical regions, and captured the devastating [2004 tsunami in southeast Asia](#)

decommissioned : on June 5, 2013

in November 2012, one of Landsat 5's redundant gyroscopes failed, leaving only two operational.^[2] If one more failed, the satellite would be left derelict in its valued orbital band

Landsat 6:

Objective: carry forward the [Landsat program](#).

Launched: launched on October 5, 1993 aboard a Titan II launch vehicle from [Vandenberg Air Force Base](#)

Landsat 6 separated from the Titan II launch vehicle as programmed, but an explosion in its liquid fuel system upon separation doomed the satellite

Landsat 6 did not achieve orbit due to a ruptured hydrazine manifold

Landsat7:

Launched: on 15 April 1999

Objective: refresh the global archive of satellite photos, providing up-to-date and cloud-free images

Malfunction:

2011 its fuel was depleted and EO-1's orbit began to degrade.

Past: present: future:

Challenge 2:

Guide:

Past: present: future:

Challenge 3:

Guide:

Past: present: future:

Crises: