SPACE MISSION DESIGN GAME

MISSION: SECOND CHANCE

An educational browser game about spacecraft design and learning from engineering decisions.

Team Hashcode
Members: Sweeta P Jose, Afra K, Hajira S.
Virudhanagar, India
NASA Space Apps Challenge 2026

A flood-observation mission

1,200

useful-data units must reach Earth

60 simulated minutes

Players must meet the science goal while keeping the spacecraft powered and respecting budget, mass and storage limits.

Spacecraft design and mission control

DESIGN

Choose an instrument, solar array, battery, orbit and launcher.

Check the budget and launch limits.

OPERATE

Observe a target, transmit data or conserve power.

Each action takes five minutes.

Clouds affect optical observations. Contact windows limit transmission.
Only transmitted observations count toward the mission goal.

Second Chance: one controlled change

1 component changes

After a mission, change the instrument, solar array or battery.
Replay the recorded actions under the same scheduled conditions.

Compare delivered science, remaining energy and cost.

Unavailable replay actions become conservation turns.

A larger battery added reserve, not science

Measure	Original	Second Chance
Battery	Standard	Extended
Useful-data units delivered	2,880	2,880
Battery remaining	50.4 Wh	140.4 Wh
Budget used	65 credits	73 credits
Outcome at 60 minutes	Success	Success

8 extra credits bought 90 Wh more remaining energy.
The same action sequence returned the same science.

Play the prototype

https://sweetapjose.github.io/mission-second-chance/

Demo sequence: Observe, Observe, Transmit. Four cycles in total.
Then test one component change with Second Chance.

NASA references in the game: NISAR and Small Spacecraft Communications.
They provide context for radar observations and data delivery.

Educational model with fictional hardware values, costs and schedules.
No live NASA datasets or operational orbit simulation.

AI assistance: ChatGPT supported planning, code, text and this presentation.
No NASA endorsement. SI-assisted presentation.