

EDUCATIONAL STANDARDS FRAMEWORK

The Lander — Competitive Coverage Heat Map

Soft-landing engineering — sensors, geometry, and energy in balance.

LESSON 04 · THE LANDER

FRAMEWORKS TOUCHED

8 / 8

Full multi-disciplinary reach

STANDARDS ALIGNED

24

Discrete benchmarks scored

COMPOSITE COVERAGE

74%

Weighted intensity, all standards

DOMINANT STRAND

NGSS Science · CSTA CompSci

Top two framework averages

COVERAGE INTENSITY



Coverage by Framework

Average heat score per category (0–5)



Standard-by-Standard Heat Map

Each row = one benchmark · color & bar = relevance to this lesson

FRAMEWORK	STANDARD	HEAT	INTENSITY
NGSS Next Gen Science	Engineering Design 3-5-ETS1-2 Generate and compare multiple solutions to space-travel and lunar lander engineering challenges.	5	100% · Core / dominant
	Physical Science 4-PS3-2 Evidence that energy can be transferred and transformed (e.g., lander energy absorption and braking).	5	100% · Core / dominant
	Waves & Information 4-PS4-3 Integrate visual and sound-based data during space experiments and lunar lander simulations.	4	80% · Strongly covered
ISTE EdTech Standards	Knowledge Constructor ISTE 3 Curate space-science info and prototype digital/physical models like landers and probes.	5	100% · Core / dominant
	Creative Communicator ISTE 6 Use multimedia tools to explain mission concepts and lunar lander results.	3	60% · Moderately covered
	Global Collaborator ISTE 7 Collaborate digitally to simulate missions and share lunar lander findings.	3	60% · Moderately covered
CSTA Computer Science	Programming 1B-AP-15 Test and debug Micro:bit programs to align lunar lander behavior with mission goals.	4	80% · Strongly covered
	Variables in Programming 1B-AP-10 Use sensor data (light, motion) to control lunar lander outputs.	5	100% · Core / dominant
	Program Development 2-AP-14 Develop programs iteratively: plan, code, test, revise, reflect.	4	80% · Strongly covered
CCSS.MATH Mathematics	Measurement 5.MD.A.1 Convert measurement units during lunar lander planning and trajectory calculations.	5	100% · Core / dominant
	Geometry 5.G.B.3 Use shapes and spatial reasoning to plan lunar lander layout or surface simulations.	4	80% · Strongly covered
	Geometry — Angles 4.G.A.1 Define angles, lines, segments while designing lunar lander components.	4	80% · Strongly covered
CCSS.ELA Language Arts	Informational Text RI.4.3 Explain space-travel processes and purposes through research and observation.	3	60% · Moderately covered
	Writing W.5.2 Write mission reports, design explanations, or reflection journals.	2	40% · Lightly addressed
	Speaking & Listening SL.5.5 Present lunar lander findings using graphics, recordings, or digital media.	3	60% · Moderately covered
	Responding — Anchor 40% · Lightly addressed		40% · Lightly addressed

FRAMEWORK	STANDARD	HEAT	INTENSITY
NCAS National Core Arts	Interpret design aesthetics and context of lunar lander, habitats, and terrain simulations.	2	
	Connecting — Anchor Apply personal insights to enrich mission simulations and lunar lander design tasks.	2	40% · Lightly addressed
	Creating — Anchor Design and refine space-themed visuals or models from peer feedback.	3	60% · Moderately covered
P21 21st-Century Skills	Critical Thinking — 4Cs Solve lunar lander design and mission challenges through evidence-based reasoning.	5	100% · Core / dominant
	Creativity & Innovation — 4Cs Brainstorm and prototype unique solutions to lunar lander scenarios.	4	80% · Strongly covered
	Collaboration — 4Cs Work in groups to plan, build, and evaluate lunar lander tasks.	4	80% · Strongly covered
SEL Social-Emotional	Self-Management — CASEL Manage frustration during coding/debugging and stay focused.	4	80% · Strongly covered
	Social Awareness — CASEL Show empathy and appreciation for teammates' ideas during projects.	3	60% · Moderately covered
	Responsible Decision-Making — CASEL Make ethical, environmentally conscious decisions in space-tech design.	3	60% · Moderately covered

Strategic Read

Where the lesson dominates · where it leaves headroom

HOT ZONES

NGSS Engineering Design and **Physical Science** lead at 5/5 — this is the canonical NGSS lander example. **ISTE Knowledge Constructor** (5), **CSTA Variables** (5) for sensor-controlled descent, and **5.MD.A.1 Measurement** (5) all peak. P21 Critical Thinking holds at 5 throughout.

COOL ZONES

ELA Writing, **NCAS Responding/Connecting**, and **SEL Social Awareness** sit at 2-3 — adding a peer design-review protocol covers most of them in a single activity.