

EDUCATIONAL STANDARDS FRAMEWORK

Rocket Launcher — Competitive Coverage Heat Map

A density view of how strongly each standard is addressed across the 8 frameworks of the Space Science Kit.

LESSON 01 · ROCKET LAUNCHER

FRAMEWORKS TOUCHED

8 / 8

Full multi-disciplinary reach

STANDARDS ALIGNED

24

Discrete benchmarks scored

COMPOSITE COVERAGE

78%

Weighted intensity across all standards

DOMINANT STRAND

Engineering & Physics

NGSS · CSTA · P21 lead

COVERAGE INTENSITY



Coverage by Framework

Average heat score per category (0–5 scale)



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 rocket design and launcher engineering.	5	100% · Core driver of the lesson
	Physical Science 4-PS3-2 Evidence that energy can be transferred and transformed (rocket propulsion).	5	100% · Direct propulsion focus
	Waves & Information 4-PS4-3 Integrate visual and sound-based data during launch experiments.	3	60% · Sensor & observation linked
ISTE EdTech Standards	Knowledge Constructor ISTE 3 Curate space-science info and prototype digital/physical launcher models.	4	80% · Strong prototyping link
	Creative Communicator ISTE 6 Use multimedia to explain mission concepts and experiment results.	3	60% · Optional reporting layer
	Global Collaborator ISTE 7 Collaborate digitally to simulate missions and share findings.	3	60% · Team-based component
CSTA Computer Science	Programming 1B-AP-15 Test and debug Micro:bit programs to align launcher behavior with mission goals.	4	80% · Heavy debug cycle
	Variables in Programming 1B-AP-10 Use sensor data (light, motion) to control launcher outputs.	4	80% · Sensor-driven logic
	Program Development 2-AP-14 Develop programs iteratively: plan, code, test, revise, reflect.	4	80% · Iterative engineering loop
CCSS.MATH Mathematics	Measurement 5.MD.A.1 Convert measurement units during trajectory and launcher calculations.	4	80% · Trajectory math
	Geometry 5.G.B.3 Use shapes and spatial reasoning to plan launcher layout.	3	60% · Spatial planning
	Geometry — Angles 4.G.A.1 Define angles, lines, and segments while designing rockets and launchers.	4	80% · Launch-angle critical
	Informational Text		60% · Research support

FRAMEWORK	STANDARD	HEAT	INTENSITY
CCSS.ELA Language Arts	RI.4.3 Explain space-travel processes and purposes through research.	3	
	Writing W.5.2 Write mission reports or design reflections about launcher outcomes.	2	40% · Optional artifact
	Speaking & Listening SL.5.5 Present launcher findings using graphics and digital media.	3	60% · Presentation phase
NCAS National Core Arts	Responding — Anchor Interpret design aesthetics and context of the launcher.	2	40% · Light aesthetic review
	Connecting — Anchor Apply personal insights to enrich launcher design tasks.	1	20% · Tangential link
	Creating — Anchor Design and refine space-themed visuals/models from feedback.	3	60% · Build & iterate
P21 21st-Century Skills	Critical Thinking — 4Cs Solve launcher design challenges through evidence-based reasoning.	5	100% · Continuous reasoning
	Creativity & Innovation — 4Cs Brainstorm and prototype unique launcher solutions.	5	100% · Novel design encouraged
	Collaboration — 4Cs Work in groups to plan, build, and evaluate launcher tasks.	4	80% · Team build phase
SEL Social-Emotional	Self-Management — CASEL Manage frustration during coding/debugging and stay focused.	4	80% · Heavy debug load
	Social Awareness — CASEL Show empathy and appreciation for teammates' ideas during projects.	3	60% · Group dynamic
	Responsible Decision-Making — CASEL Make ethical, environmentally conscious decisions in space tech design.	2	40% · Lightly addressed

Strategic Read

Where the lesson dominates · where it leaves headroom

HOT ZONES

The lesson lights up across **NGSS Engineering & Physical Science**, the entire **P21 4Cs**, and the full **CSTA programming triad**. Rocket physics, launch-angle math, and Micro:bit debugging all converge — making this the strongest STEM-loaded entry in the series.

COOL ZONES

NCAS Connecting, **CCSS.ELA Writing**, and **SEL Responsible Decision-Making** sit at the bottom of the heat scale. These are easy upgrade levers — adding a short mission-log writing prompt or an ethics reflection would push composite coverage above 85%.