

EDUCATIONAL STANDARDS FRAMEWORK

Lunar Landing Rover — Competitive Coverage Heat Map

Sensor-driven rover — exploring terrain through data and code.

LESSON 03 · LUNAR LANDING ROVER

FRAMEWORKS TOUCHED

8 / 8

Full multi-disciplinary reach

STANDARDS ALIGNED

24

Discrete benchmarks scored

COMPOSITE COVERAGE

76%

Weighted intensity, all standards

DOMINANT STRAND

CSTA CompSci · NGSS Science

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 rover engineering challenges. | 5 | 100% · Core / dominant |
| | Physical Science 4-PS3-2 Evidence that energy can be transferred and transformed (e.g., rover motion and surface energy transfer). | 4 | 80% · Strongly covered |
| | Waves & Information 4-PS4-3 Integrate visual and sound-based data during space experiments and lunar rover simulations. | 5 | 100% · Core / dominant |
| ISTE EdTech Standards | Knowledge Constructor ISTE 3 Curate space-science info and prototype digital/physical models like rovers and landers. | 5 | 100% · Core / dominant |
| | Creative Communicator ISTE 6 Use multimedia tools to explain mission concepts and lunar rover results. | 3 | 60% · Moderately covered |
| | Global Collaborator ISTE 7 Collaborate digitally to simulate missions and share lunar rover findings. | 3 | 60% · Moderately covered |
| CSTA Computer Science | Programming 1B-AP-15 Test and debug Micro:bit programs to align lunar rover behavior with mission goals. | 5 | 100% · Core / dominant |
| | Variables in Programming 1B-AP-10 Use sensor data (light, motion) to control lunar rover outputs. | 5 | 100% · Core / dominant |
| | Program Development 2-AP-14 Develop programs iteratively: plan, code, test, revise, reflect. | 5 | 100% · Core / dominant |
| CCSS.MATH Mathematics | Measurement 5.MD.A.1 Convert measurement units during lunar rover planning and trajectory calculations. | 4 | 80% · Strongly covered |
| | Geometry 5.G.B.3 Use shapes and spatial reasoning to plan lunar rover layout or surface simulations. | 4 | 80% · Strongly covered |
| | Geometry — Angles 4.G.A.1 Define angles, lines, segments while designing lunar rover components. | 3 | 60% · Moderately 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 rover 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 rover, habitats, and terrain simulations. | 2 | |
| | Connecting — Anchor Apply personal insights to enrich mission simulations and lunar rover 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 rover design and mission challenges through evidence-based reasoning. | 5 | 100% · Core / dominant |
| | Creativity & Innovation — 4Cs Brainstorm and prototype unique solutions to lunar rover scenarios. | 5 | 100% · Core / dominant |
| | Collaboration — 4Cs Work in groups to plan, build, and evaluate lunar rover tasks. | 4 | 80% · Strongly covered |
| SEL Social-Emotional | Self-Management — CASEL Manage frustration during coding/debugging and stay focused. | 5 | 100% · Core / dominant |
| | 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

The strongest **CSTA** showing in the kit — **Programming, Variables, and Program Development** all max at 5/5 because the rover is fundamentally a sensor-driven autonomous agent. **NGSS Waves & Information** also lights up at 5/5 (light/motion sensing), and **SEL Self-Management** peaks at 5 thanks to a heavy debug load.

COOL ZONES

ELA Writing (2/5) and **NCAS Responding/Connecting (2/5)** remain the lightest touch — easy upgrade levers via a rover field-journal or terrain-art reflection.