

THE MOONWALKERS

A JOURNEY WITH TOM HANKS



HIGH SCHOOL CURRICULUM GUIDE

FLORIDA STATE STANDARDS ALIGNED



With gratitude to:

Amdur Family Foundation
The Cornelia T. Bailey Foundation
Daniel L. Prince Foundation
Eunice Joyce Gardiner Charitable Foundation
Estate of Lynn K. Hoerber
Klorfine Foundation

CONTENTS

1	Welcome
2	About The Moonwalkers
4	Factsheet 1: The Apollo Missions
12	Factsheet 2: Life on the International Space Station
17	In the Classroom
18	Language Arts
22	Science
28	Mathematics
30	Visual Arts
34	Student Worksheets
36	Space Related Educational Resources

EXERCISE	SUBJECT	TOPIC	Pg No.
Mission Journalist: Reporting the Artemis Generation	Language Arts	Informational Writing, Scientific Research, Media Literacy, Apollo & Artemis Programs	PG. 18
Engineering a Sustainable Lunar Habitat	Science	Engineering Design Process, Lunar Environment	PG. 22
Artemis Mission Systems Analysis	Mathematics	Data Analysis, Mathematical Modeling	PG. 28
Designing the Identity of a Space Mission	Visual Arts	Symbolism, Visual Communication, NASA	PG. 30



WELCOME

Welcome to the education guide accompanying
The Moonwalkers: A Journey with Tom Hanks.

Designed for students ages 14–18 and aligned with Florida's Grade 10 Science, English Language Arts, Visual Arts and Mathematics Standards, this guide provides engaging lessons, activities, and resources to enrich the learning experience before and after viewing the exhibition.

Through hands-on activities and cross-curricular connections, students will explore the science, history, geography, engineering, and innovation behind the Apollo lunar missions. They will discover how curiosity, teamwork, and perseverance helped make one of humanity's greatest achievements possible.

We hope this experience inspires the next generation of explorers, encouraging students to dream big and develop a lifelong interest in science, technology, engineering, mathematics (STEM), creativity, and space exploration. Perhaps for one student, this journey will become a core memory that sparks a passion for reaching beyond the stars.

ABOUT THE MOONWALKERS: A JOURNEY WITH TOM HANKS

Narrated and created by Tom Hanks, **The Moonwalkers: A Journey with Tom Hanks** is an immersive experience that offers a unique perspective on humanity's past and future voyages to the Moon.

The experience tells the story of the Apollo missions that landed astronauts on the Moon between 1969 and 1972 while also exploring the future of lunar exploration through NASA's Artemis program. Audiences are taken behind the scenes of Artemis, which aims to return astronauts to the lunar surface and pave the way for future deep-space exploration.

Using stunning large-scale projections and immersive audio, the show transports audiences on an unforgettable journey through space. Beginning on Earth, visitors travel to the Moon before returning home, experiencing four distinct chapters that explore the history, science, and future of human spaceflight.

The full experience lasts approximately **55 minutes** and is designed to be viewed from the beginning, with presentations starting every hour on the hour.

The Moonwalkers was co-written by Tom Hanks and Christopher Riley, the two-time BAFTA-nominated writer and director whose work includes acclaimed space documentaries and television programs for the BBC, Netflix, and PBS.

Tom Hanks narrates the experience, sharing personal reflections that reveal his lifelong fascination with space exploration. His narration is accompanied by an original score composed by acclaimed musician Anne Nikitin, creating a powerful and inspiring journey for audiences of all ages.



Image credit: Justin Sutcliffe

FACTSHEET 1: The Apollo Missions

Objective

Before students experience **The Moonwalkers: A Journey with Tom Hanks**, introduce them to the Apollo Program and its lasting impact on science, technology, and space exploration. Use the information below to build background knowledge and encourage classroom discussion.

The Apollo Program

Share the following overview with your students:

The **Apollo Program** was a series of NASA human spaceflight missions that achieved one of history's greatest accomplishments—landing the first humans on the Moon. The program is best known for **Apollo 11**, which successfully landed astronauts **Neil Armstrong** and **Buzz Aldrin** on the lunar surface on **July 20, 1969**.

The Apollo Program was not only a technological triumph but also a major scientific breakthrough. Each mission returned unique rock and soil samples from different locations on the Moon, helping scientists better understand the Moon's history, composition, and formation.

What Was the Apollo Program?

- The Apollo Program was a NASA initiative that sent astronauts to the Moon. There were **11 crewed Apollo** missions between **1968** and **1972**.
- The **first four missions** tested the spacecraft and equipment needed for lunar travel.
- **Six of the remaining seven missions** successfully landed astronauts on the Moon.
- The **first Moon landing** took place in **1969**, and the **last** occurred in **1972**.
- In total, **12 astronauts** walked on the Moon. They explored the lunar surface, conducted scientific experiments, collected Moon rocks, and brought them back to Earth for study.



Image credit: NASA

What Spacecraft Were Used During the Apollo Program?

- NASA developed the **Apollo Command Module**, which carried **three astronauts** to and from the Moon. The crew cabin was about the size of a compact car.
- The **Lunar Module** was designed to carry **two astronauts** from lunar orbit to the Moon's surface and safely return them to the Command Module in orbit.
- NASA used two types of rockets during the Apollo Program: the **Saturn IB** and the **Saturn V**.
- The **Saturn IB** was a **two-stage rocket** used during the early Apollo missions to test the spacecraft in Earth orbit. Standing about as tall as a **22-story building**, it helped prepare astronauts and equipment for future lunar missions.
- The remaining Apollo missions used the more powerful **Saturn V**, a **three-stage rocket** capable of sending astronauts to the Moon. Standing approximately **36 stories tall**, it remains one of the most powerful rockets ever built.

When Did Humans First Visit the Moon?

- **Apollo 8** was the first crewed mission to travel to the Moon. Although it did not land, it became the first mission to orbit the Moon before safely returning to Earth. Apollo 8 completed its historic lunar orbit on **Christmas Eve, 1968**.
- **Apollo 11** made the first successful Moon landing on **July 20, 1969**. The crew consisted of **Neil Armstrong, Buzz Aldrin, and Michael Collins**. Armstrong and Aldrin landed on the Moon while Collins remained in lunar orbit aboard the Command Module.
- Neil Armstrong became the **first person to walk on the Moon**, famously saying, "That's one small step for man, one giant leap for mankind."
- **Apollo 13** became one of NASA's most famous missions after an in-flight explosion prevented a planned Moon landing. NASA successfully guided the astronauts around the Moon and safely back to Earth. Their remarkable journey inspired the award-winning film **Apollo 13**.

FACTSHEET 1: The Apollo Missions

How Did Astronauts Land on the Moon?

- Apollo missions launched aboard the **three-stage Saturn V rocket**. The first two stages lifted the spacecraft into space, while the third stage propelled it toward the Moon.
- Once in lunar orbit, the **Lunar Module** separated from the **Command Module**. Two astronauts descended to the Moon's surface while the third astronaut remained in orbit.
- During the final three Apollo missions, astronauts used the **Lunar Roving Vehicle (Lunar Rover)** to travel across the Moon and explore a larger area. The rover was specially designed to fold and fit inside the Lunar Module during launch and was left on the Moon after each mission.
- After completing their work, the astronauts returned to the **Lunar Module**, launched back into lunar orbit, and docked with the Command Module. They transferred back into the **Command Module**, leaving the Lunar Module behind.
- Finally, the crew traveled back to Earth. The **Command Module** re-entered Earth's atmosphere and splashed down safely in the ocean, where recovery ships retrieved the astronauts.

Discussion Questions

Use these questions to guide classroom discussion before the experience:

- Why did the United States send astronauts to the Moon?
- What scientific information did Apollo missions collect?
- What technologies were required?
- What risks did astronauts face?
- Why did crewed lunar missions stop after 1972?
- Why are governments and private companies interested in returning?

BEFORE A TRIP

AFTER A TRIP



PEOPLE WHO WALKED ON THE MOON

AS PART OF THE APOLLO PROGRAM

THE MOONWALKERS

1969-72

Apollo 11
21.07.1969

COMMANDER
Neil A. Armstrong

LUNAR MODULE PILOT
Edwin E. 'Buzz' Aldrin

Apollo 14
05.02.1971

COMMANDER
Alan P. Shepherd

LUNAR MODULE PILOT
Edgar D. Mitchell

Apollo 16
21.04.1972

COMMANDER
John W. Young

LUNAR MODULE PILOT
Charles M. Duke

AFTER A TRIP

IN THE CLASSROOM

Apollo 12
19.11.1969

COMMANDER
Charles 'Pete' Conrad

LUNAR MODULE PILOT
Alan L.Bean

Apollo 15
31.07.1971

COMMANDER
David R. Scott

LUNAR MODULE PILOT
James B. Irwin

Apollo 17
11.12.1972

COMMANDER
Eugene A. Cernan

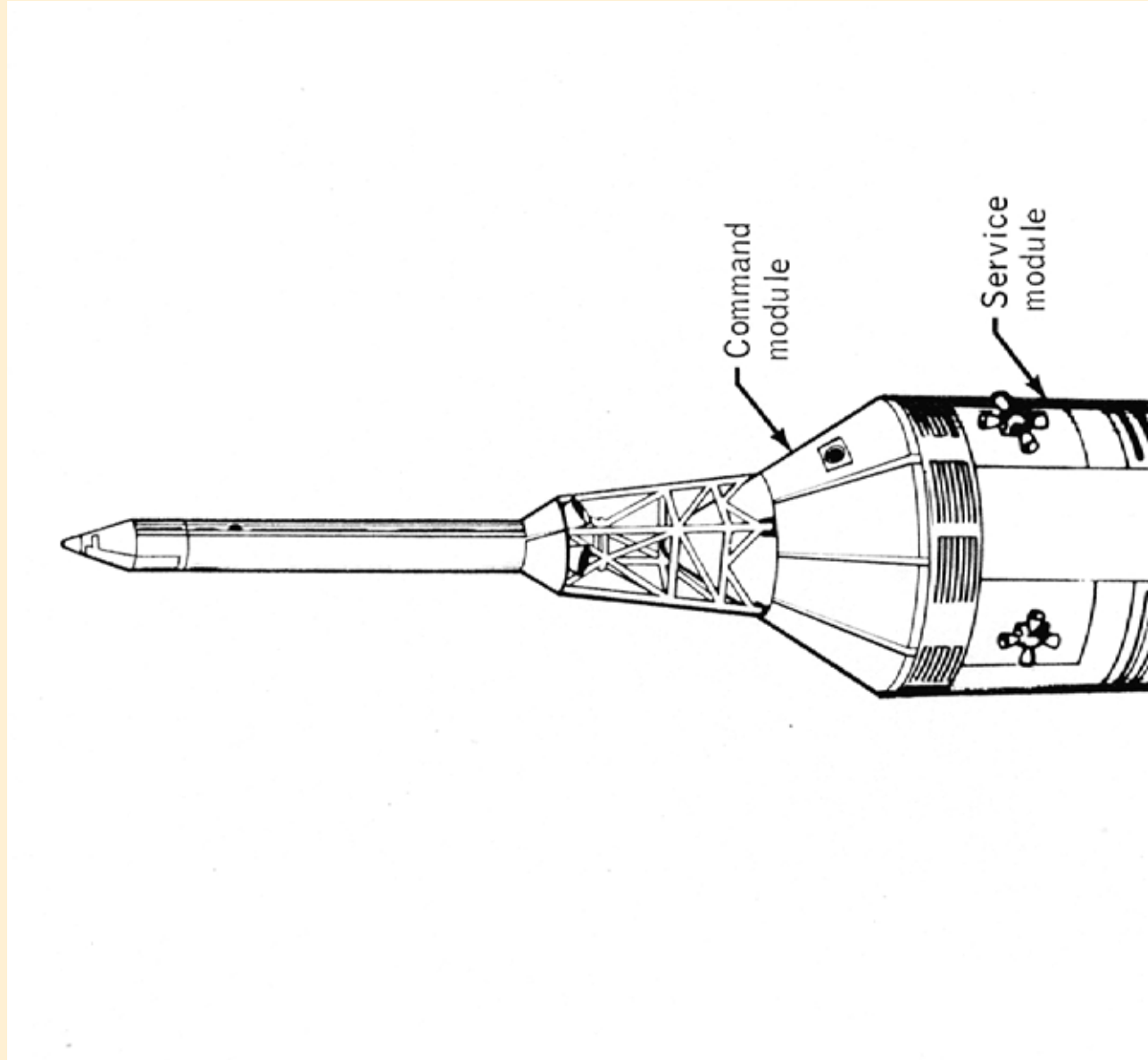
LUNAR MODULE PILOT
Harrison H. Schmitt

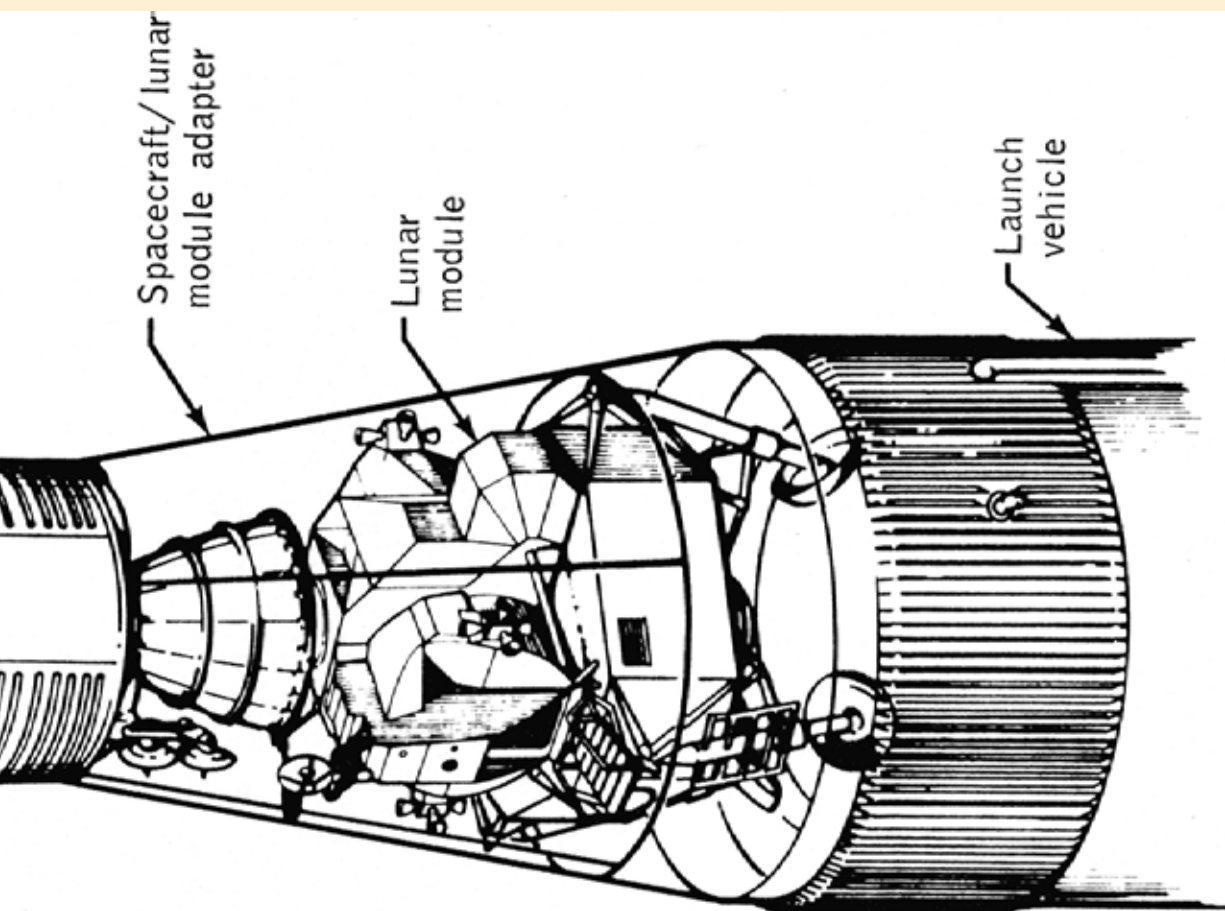
2025

THE FUTURE MOONWALKERS

Image credit: Justin Sutcliffe

THE ROCKET THAT PUT MAN ON THE MOON





**APOLLO LAUNCH CONFIGURATION FOR
LUNAR LANDING MISSION**

FACTSHEET 2: Life on the International Space Station (ISS)

Use the information below to introduce students to daily life aboard the **International Space Station (ISS)**. Encourage students to compare life in space with life on Earth and discuss how astronauts adapt to living in a microgravity environment.

Sleeping

Astronauts are weightless in space, so they can sleep in almost any position. On the ISS, crew members sleep in individual sleeping bags inside small crew cabins. Their sleeping bags are attached to the wall to prevent them from floating around while they sleep. Each crew cabin is designed for one astronaut and provides a quiet, private space for rest.

Eating

Astronauts have a wide variety of foods to choose from, including fruits, nuts, chicken, beef, seafood, desserts, and brownies.

Available beverages include:

- Coffee
- Tea
- Orange juice
- Fruit punch
- Lemonade

Astronauts also have access to condiments such as ketchup, mustard, and mayonnaise. However, **salt and pepper are provided in liquid form** because loose grains would float away in microgravity.

Some foods, such as crackers and dried fruit, can be eaten as packaged. Others, including macaroni and cheese or spaghetti, require water before they can be eaten. The ISS also has food warmers to heat meals.

Because there are **no refrigerators** on the space station, all food must be carefully packaged, stored, and prepared to remain safe during long missions.



Using the Toilet

The toilet aboard the ISS looks similar to one on Earth but works very differently. Astronauts secure themselves to the toilet so they do not float away. A vacuum system uses airflow to collect waste, which is then dried and stored for disposal.

Keeping Clean

Astronauts do not take traditional showers on the ISS. Instead, they use no-rinse soap, small amounts of water, and rinse-free shampoo. Water and soap are dispensed from pouches, and towels are used to wipe away excess moisture.

Reflection

After discussing life aboard the ISS, encourage students to reflect on what it would be like to live in space for months at a time.

Discussion Questions

- What do you think would be the biggest challenge about living on the International Space Station?
- What would you miss most about living on Earth?
- What comforts from home would you want to bring with you?

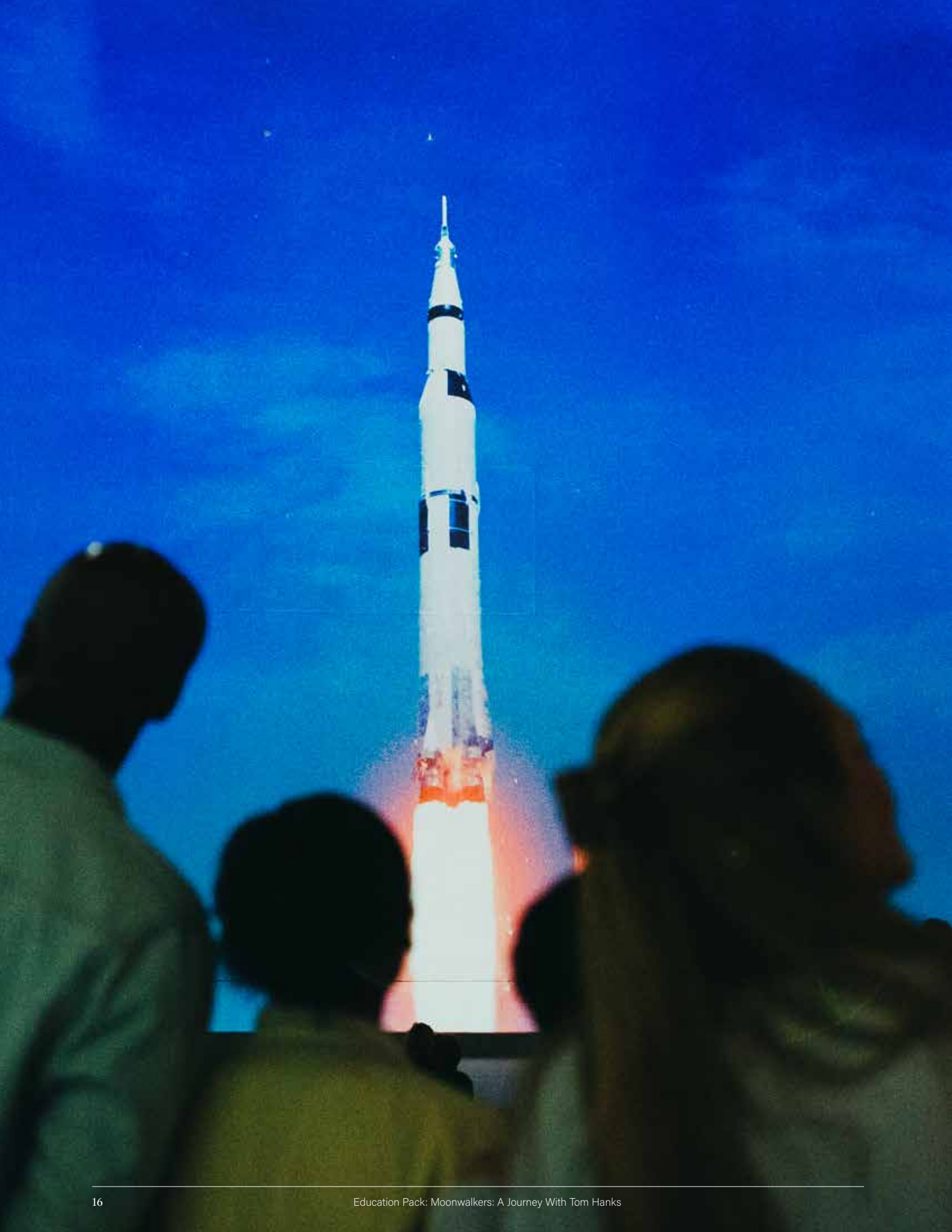
Discuss how food provides more than just nutrition. It can remind people of family, traditions, and home. Ask students why astronauts might enjoy eating familiar foods while living in space.

Activity

Challenge students to design an astronaut meal pack that is nutritious, easy to store, and suitable for space travel. Have students explain why they selected each food item and how it would support astronauts during a mission.



**Additional Resources
Located under
Space-Related
Education Resources
on Pg. 36**



BEFORE THE EXPERIENCE - IN THE CLASSROOM

LANGUAGE ARTS

Florida B.E.S.T. Standards

- **ELA.10.R.2.1** - Analyze the impact of multiple text structures and the use of features in text(s).
- **ELA.10.R.2.2** - Analyze the central idea(s) of historical American speeches and essays.
- **ELA.10.R.2.4** - Compare the development of two opposing arguments on the same topic, evaluating the effectiveness and validity of the claims and analyzing the ways in which the authors use the same information to achieve different ends.
- **ELA.10.C.1.3** - Write to argue a position, supporting claims using logical reasoning and credible evidence from multiple sources, rebutting counterclaims with relevant evidence, using a logical organizational structure, elaboration, purposeful transitions, and maintaining a formal and objective tone.
- **ELA.10.C.1.4** - Write expository texts that explain complex ideas using appropriate organization and evidence.
- **ELA.10.C.4.1** - Conduct research to answer a question, refining the scope of the question to align with findings and synthesizing information from multiple reliable and valid sources.
- **ELA.10.C.5.1** - Create digital presentations to improve understanding of findings, reasoning, and evidence.
- **ELA.10.V.1.1** - Integrate academic vocabulary appropriate to grade level in speaking and writing.

Learning Objectives:

Students will:

- Analyze the organization and features of science journalism.
- Distinguish fact, interpretation, and opinion.
- Evaluate the credibility of sources.
- Develop a focused research question.
- Integrate evidence from multiple sources.
- Explain a scientific concept for a nonexpert audience.
- Use quotations and attribution correctly.
- Write and revise an objective feature article.

Classroom Activity: Reporting the Artemis Generation

Students become science journalists assigned to report on a future Artemis mission. They research a mission event, evaluate sources, interview a simulated specialist, explain technical information, and write an accurate article for a general audience.

Possible topics include:

- Astronauts return to the lunar surface
- Deployment of a lunar rover
- Discovery of accessible lunar water ice
- Failure of an important habitat system
- Construction of a lunar habitat
- International partnership on the Moon
- Completion of a 30-day lunar mission
- Debate over the use of lunar resources

(Provide students with *[Mission Journalist Organizer](#) and *[Source Credibility Evaluation](#))

***Refer to QR code located with Student Worksheets on Pg. 36**

Essential Question

How can journalists communicate complex scientific information accurately and meaningfully?

Engage

Display two headlines:

NASA Builds a Base on the Moon

Artemis Crew Completes First Long-Duration Habitat Test Near Lunar South Pole

Ask students:

- Which headline is more precise?
- Which raises more useful questions?
- What evidence would be needed to verify the report?
- What information should appear in the first paragraph?

Mini-Lesson: Science Journalism

A strong science article should:

- Begin with the most important development.
- Identify the source of major claims.
- Explain unfamiliar terms.
- Distinguish evidence from prediction.
- Include appropriate context.
- Avoid exaggeration.
- Represent uncertainty honestly.
- Explain why the development matters.

Student Task

Students select or receive a future Artemis scenario.

They complete the **Mission Journalist Organizer**, including:

- Research question
- 5 Ws and H
- Mission background
- Five verified facts
- Three credible sources
- Expert interview questions
- Direct quotation
- Scientific explanation
- Headline
- Lead paragraph
- Article structure
- Visual and caption

- **SSC.912.N.1.1** - Define a problem, conduct an investigation, analyze data, evaluate evidence, and defend conclusions.
- **SC.912.N.1.6** - Describe how scientific inferences are drawn from observations and evidence.
- **SC.912.P.10.1** - Differentiate among forms of energy and recognize energy transformations.
- **SC.912.P.10.4** - Describe heat as the energy transferred by convection, conduction, and radiation.
- **SC.912.P.12.2** - Analyze relationships among position, velocity, acceleration, and time.
- **SC.912.P.12.4** - Describe applications of the laws of motion.
- **SC.912.P.12.6** - Apply concepts associated with rotational or orbital motion.
- **SC.912.E.5.4** - Explain the physical properties of planets, moons, and other solar-system bodies.
- **SC.912.E.5.6** - Develop models of solar-system motion and gravitational interactions.
- **SC.912.L.14.6** - Explain how human systems maintain homeostasis under changing environmental conditions.

Learning Objectives:

Students will:

- Describe major conditions on the lunar surface.
- Explain how environmental conditions affect humans and equipment.
- Define a design problem and identify constraints.
- Research possible engineering solutions.
- Develop and compare design alternatives.
- Create a labeled habitat model.
- Use scientific evidence to justify design choices.
- Evaluate and revise a design following peer review.

Classroom Activity: Engineering a Sustainable Lunar Habitat

Mission Scenario

NASA has selected your engineering team to propose a lunar habitat near the Moon's South Pole.

The habitat must:

- Support four astronauts for 30 days.
- Fit within a 30-meter by 30-meter site.
- Include primary and backup power.
- Recycle water and air.
- Protect the crew from radiation.
- Reduce lunar-dust contamination.
- Include an emergency shelter.
- Support scientific research.
- Allow future expansion.
- Minimize supplies transported from Earth.

(Provide students with *[Lunar Habitat Planning Sheet](#))

***Refer to QR code located with Student Worksheets on Pg. 36**

Essential Question

How can engineers design a safe and sustainable habitat in an environment that does not naturally support human life?

Required Habitat Systems

Structure

- Exterior shell
- Radiation shielding
- Thermal insulation
- Micrometeorite protection
- Foundation or anchoring system

Life Support

- Oxygen supply
- Carbon-dioxide removal
- Air filtration
- Water storage
- Water recycling
- Waste management
- Temperature control

Crew Areas

- Sleeping quarters
- Food preparation
- Hygiene area
- Exercise area
- Medical station
- Work area
- Laboratory

Operations

- Airlock
- Communications
- Equipment storage
- Rover access
- Power distribution
- Emergency shelter
- Dust-control system

Engineering Design Process

1. Define

What problem must the habitat solve?

2. Research

What scientific information is needed?

3. Establish Criteria

What must the design accomplish?

4. Identify Constraints

What limitations affect the design?

5. Brainstorm

Create at least three possible layouts or systems.

6. Select

Use a decision matrix to select the strongest concept.

7. Develop

Create a scaled plan and detailed explanation.

8. Test

Evaluate the design using failure scenarios.

9. Improve

Revise the design based on evidence and feedback.

10. Communicate

Present the final proposal.

Failure Scenarios

Each team receives one scenario:

- Solar panels are damaged.
- A water-recycling component fails.
- Lunar dust enters the airlock.
- Communication with Earth is interrupted.
- A crew member requires medical isolation.
- A micrometeorite damages an exterior wall.
- Battery capacity falls below expected levels.
- One habitat module loses pressure.

Teams must explain:

1. How the crew detects the problem.
2. What immediate action is required.
3. Which backup system is activated.
4. How the design reduces danger.
5. What long-term revision should be made?

Scientific Justification

Students submit a written explanation addressing:

- Why the habitat is located at the selected site
- How radiation exposure is reduced
- How temperature is controlled
- How air and water are recycled
- How energy is generated and stored
- How lunar dust is controlled
- How human health is supported
- How the design uses resources efficiently
- How the habitat could be expanded

MATHEMATICS

Florida B.E.S.T. Standards

- **MA.912.AR.1** - Interpret and rewrite algebraic expressions and equations in equivalent forms.
- **MA.912.F.1** - Understand, compare and analyze properties of functions.
- **MA.912.GR.2** - Apply properties of transformations to describe congruence or similarity.
- **MA.912.DP.1** - Summarize, represent and interpret categorical and numerical data with one and two variables.
- **MA.912.AR.3** - Write, solve and graph quadratic equations, functions and inequalities in one and two variables.

Learning Objectives:

- Apply mathematical modeling to solve authentic NASA mission-planning challenges.
- Use formulas, proportional reasoning, and measurement to design a lunar habitat.
- Analyze mission data using tables, graphs, and equations.
- Calculate cargo mass, food, water, oxygen, and energy requirements for a 30-day Artemis mission.
- Develop and defend budget recommendations using mathematical evidence.
- Evaluate how changes in mission variables affect the success of a lunar mission.
- Communicate mathematical reasoning using appropriate mathematical language, symbols, and visual representations.

Classroom Activity: Artemis Mission Systems Analysis

Students use mathematical models to plan supplies, habitat dimensions, power, cargo, and costs for a simulated 30-day lunar mission.

Teachers may adjust the level of mathematics according to the course.

Essential Question:

How can mathematical models help mission planners make decisions when resources are limited?

Provide students with *[Mission Systems Mathematics Workbook](#).

***Refer to QR code located with Student Worksheets on Pg. 36**

VISUAL ART

- **VA.912.C.3.1** - Use descriptive terms and varied approaches in art analysis to explain the meaning or purpose of an artwork.
- **VA.912.O.1.1** - Use the structural elements of art and the organizational principles of design in works of art to establish an interpretive and technical foundation for visual coherence.
- **VA.912.F.1.4** - Use technological tools to create art with varying effects and outcomes.

Learning Objectives:

- Analyze historical and contemporary mission-patch designs.
- Identify symbolism and visual hierarchy.
- Explain how color, shape, line, typography, and imagery convey meaning.
- Research the goals of a future mission.
- Produce multiple design concepts.
- Participate in a formal critique.
- Revise a design based on feedback.
- Write an artist statement using appropriate art vocabulary.

Classroom Activity: Designing the Identity of a Space Mission

NASA astronauts wear **mission patches** that represent the goals, crew, and spirit of each space mission. Begin by showing students examples of NASA mission patches from the Apollo and Artemis programs. Discuss how each patch uses symbols, colors, and imagery to represent the mission's purpose, crew, and goals.

After the discussion, have students design their own mission patch for a future Artemis mission.

Classroom Activity: Design Brief

Create a mission patch for a future lunar mission.
(Provide students with [*Mission Patch Analysis Worksheet](#))

The patch must include:

- Mission name
- Mission number or year
- Destination or objective
- At least three meaningful symbols
- Intentional color choices
- Legible typography
- A clear focal point
- Visual balance
- An original slogan or motto
- Evidence of revision

***Refer to QR code located with Student Worksheets on Pg. 36**

Design Process

Research

- Investigate the mission's purpose and audience.

Brainstorm

- List at least ten possible symbols.

Thumbnail Sketches

- Produce three distinct concepts.

Selection

- Choose one design using established criteria.

Critique

- Present the design to peers.

Revision

- Document at least three changes.

Production

- Create a polished final version.

Reflection

- Write an artist statement.

Artist Statement Requirements

- The artist statement should explain:
 1. The purpose of the mission.
 2. The intended audience.
 3. The meaning of each major symbol.
 4. The reason for the selected colors.
 5. The use of design principles.
 6. Historical or cultural references.
 7. Changes made after critique.
 8. How the final design communicates the mission's values.
 9. Is there a personal connection to the subject, design, etc.

Suggested length: 300–500 words. (4-5 paragraphs with 4-6 sentences each)

Artist statement Teacher *[Rubric](#).

***Refer to QR code located with Student Worksheets on Pg. 36**



Gallery of human space flight mission patches from Project Mercury, Project Gemini, Project Apollo, the Shuttle Program, the International Space Station Expeditions, and SpaceX Crew Missions.

STUDENT WORKSHEETS INCLUDED

- [Mission Journalist Organizer](#)
- [Source Credibility Evaluation](#)
- [Lunar Habitat Planning Sheet](#)
- [Mission Systems Mathematics Workbook](#)
- [Mission Systems Mathematics Workbook Teacher Answer Key](#)
- [Mission Patch Analysis Worksheet](#)
- [Artist Statement Worksheet - Teacher Rubric](#)
- [Art Terms Reference Sheet](#)
- [Apollo-Artemis Comparison Chart](#)

SPACE-RELATED EDUCATION RESOURCES

- NASA Artemis: <https://www.nasa.gov/artemis>
- NASA Moon: <https://moon.nasa.gov>
- International Observe the Moon Night: <https://moon.nasa.gov/observe-the-moon-night/>
- NASA Kahoot: <https://create.kahoot.it/profiles/47774408-45c3-48ba-8469-e2b65e31740d>
- NASA Workforce & Careers: https://www.youtube.com/playlist?list=PLTUZypZ67cdteB_l646K7iSt1h_yBJFLx

Factsheet 2 Additional Resources

- What Is the International Space Station?: <https://www.nasa.gov/learning-resources/for-kids-and-students/what-is-the-international-space-station-grades-5-8/>
- Life On the International Space Station: An Astronaut's Day <https://florida.pbslearningmedia.org/resource/nyis16-sci-lifeonboard/life-on-the-international-space-station-an-astronauts-day/>

SCAN FOR
WORKSHEETS



Mission Control Center during Apollo 15.