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Language Power— Grades 6–8 Level C

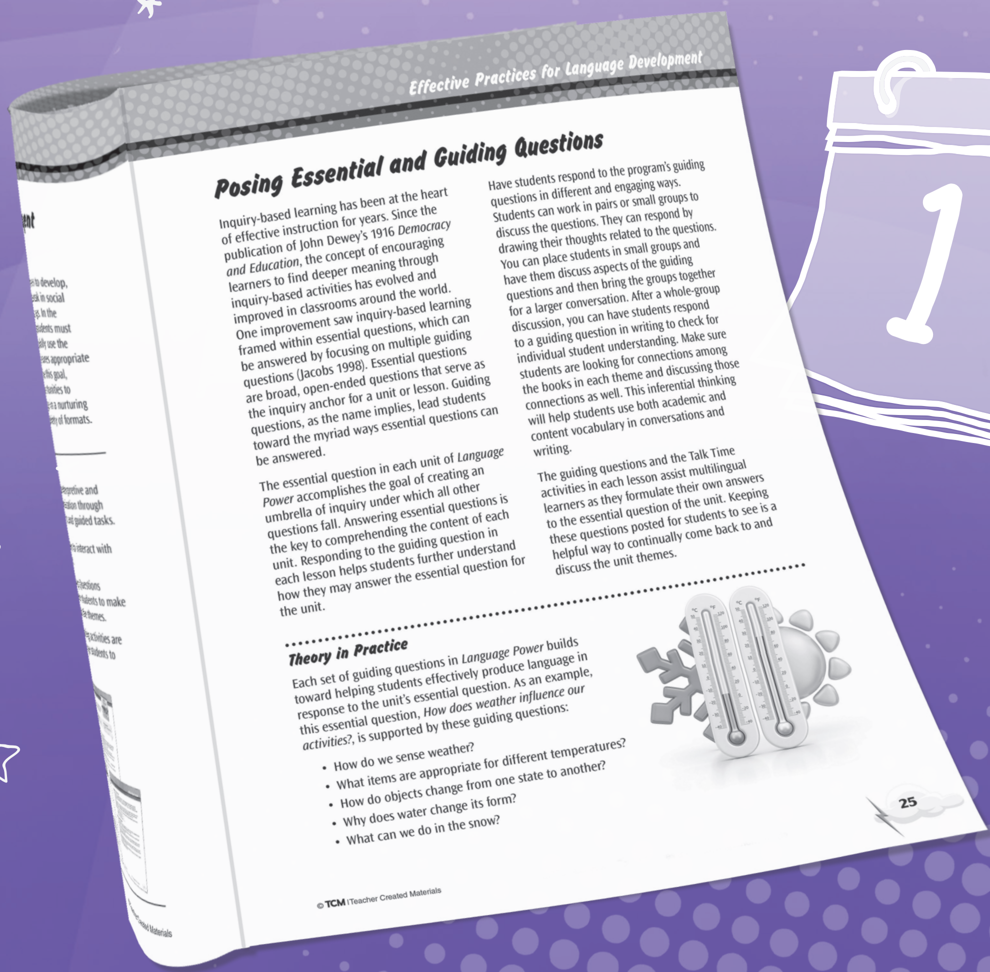
This sample includes the following:

Management Guide (10 pages)
Sample Reader
Sample Lesson Plan (7 pages)
Sample Student Guided Practice Book pages (4 pages)
Sample Digital Pages (5 pages)
Sample Unit Assessment (6 pages)

Grades 6–8

LANGUAGE POWER

Management Guide


Effective Practices for Language Development

Posing Essential and Guiding Questions

Inquiry-based learning has been at the heart of effective instruction for years. Since the publication of John Dewey's 1916 *Democracy and Education*, the concept of encouraging learners to find deeper meaning through inquiry-based activities has evolved and improved in classrooms around the world. One improvement saw inquiry-based learning framed within essential questions, which can be answered by focusing on multiple guiding questions (Jacobs 1998). Essential questions are broad, open-ended questions that serve as the inquiry anchor for a unit or lesson. Guiding questions, as the name implies, lead students toward the myriad ways essential questions can be answered.

The essential question in each unit of *Language Power* accomplishes the goal of creating an umbrella of inquiry under which all other questions fall. Answering essential questions is the key to comprehending the content of each unit. Responding to the guiding question in each lesson helps students further understand how they may answer the essential question for the unit.

Have students respond to the program's guiding questions in different and engaging ways. Students can work in pairs or small groups to discuss the questions. They can respond by drawing their thoughts related to the questions. You can place students in small groups and have them discuss aspects of the guiding questions and then bring the groups together for a larger conversation. After a whole-group discussion, you can have students respond to a guiding question in writing to check for individual student understanding. Make sure students are looking for connections among the books in each theme and discussing those connections as well. This inferential thinking will help students use both academic and content vocabulary in conversations and writing.

The guiding questions and the Talk Time activities in each lesson assist multilingual learners as they formulate their own answers to the essential question of the unit. Keeping these questions posted for students to see is a helpful way to continually come back to and discuss the unit themes.

Theory in Practice

Each set of guiding questions in *Language Power* builds toward helping students effectively produce language in response to the unit's essential question. As an example, this essential question, *How does weather influence our activities?*, is supported by these guiding questions:

- How do we sense weather?
- What items are appropriate for different temperatures?
- How do objects change from one state to another?
- Why does water change its form?
- What can we do in the snow?

25

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Table of Contents

Integrating the Four Language Domains

Language development is a complex process—one that requires students to develop language in four domains: listening, speaking, reading, and writing. And for students to become proficient in a language, these skills cannot be discreetly learned. The WIDA ELD Standards Framework Language Expectations (2020) incorporate the four language domains in a broader framework consisting of two modes of communication: interpretive and expressive. The interpretive mode includes listening, reading, and viewing. The expressive mode includes speaking, writing, and representing.

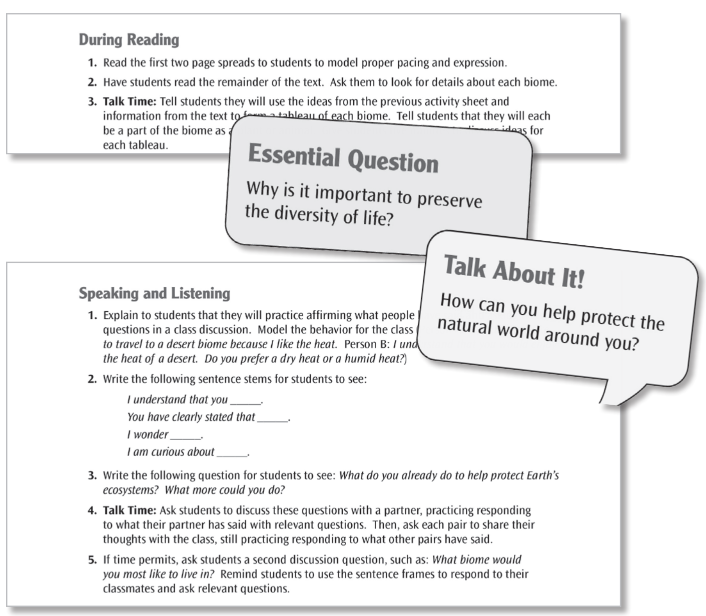
Through the act of listening, students work to understand and interpret what is heard, whether in a social conversation or an academic setting. In both settings, students observe body language and other clues that add context to the language. For example, when a teacher explains the life cycle of a plant, they may point to a graphic representation, which provides context for students to understand the language. Students need many opportunities, rich with verbal and nonverbal language, to learn and practice these active listening skills.

As language continues to develop, students begin to speak in social and academic settings. In academic contexts, students must learn to accurately and successfully use the vocabulary and language structures appropriate for all content areas. To achieve this goal, students need consistent opportunities to experiment with new language in a nurturing environment and in a wide variety of formats.

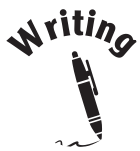
Theory in Practice

Language Power builds both interpretive and expressive modes of communication through varied instructional materials and guided tasks.

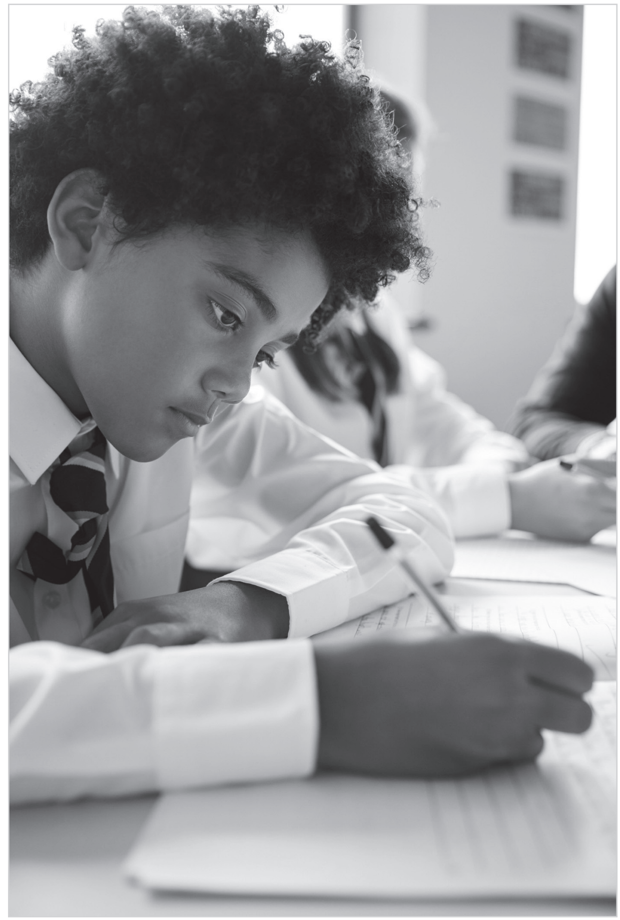
- Talk Time allows students to interact with peers during the lesson.
- The essential and guiding questions provide opportunities for students to make connections and discuss the themes.
- The Speaking and Listening activities are interactive and encourage students to produce language or represent it in creative ways.



For students to become fluent readers, they must move beyond decoding to understand and interpret a range of texts. With this goal in mind, students need access to texts and purposeful instruction on an assortment of topics and genres across all content areas. Students should be encouraged to read a text multiple times and to interact with a wide variety of language structures. And instructional sequences should provide guided practice of reading strategies and skills.



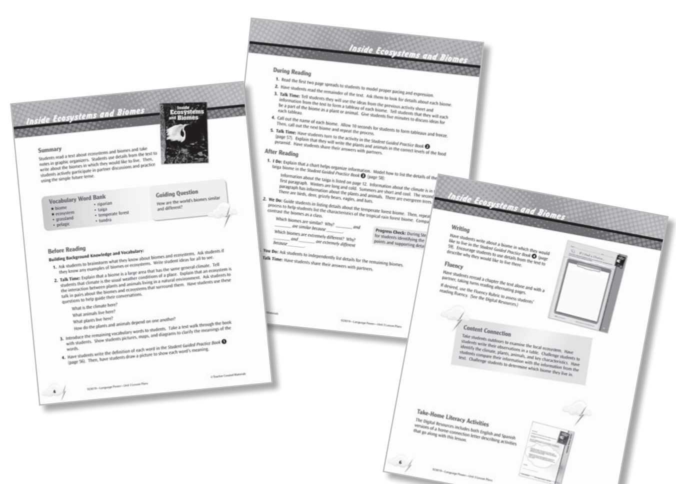
Writing skills must be developed for diverse purposes (e.g., to inform, to persuade, to entertain), for a variety of audiences and a range of forms. Students should be allowed to write about topics they find relevant and engaging. Of benefit are sentence starters, paragraph frames, and graphic organizers to plan and organize their writing, as well as modeled instruction in revising and editing their written work (Kongsvik 2016). Students need thoughtful support to intertwine these elements to become proficient writers.



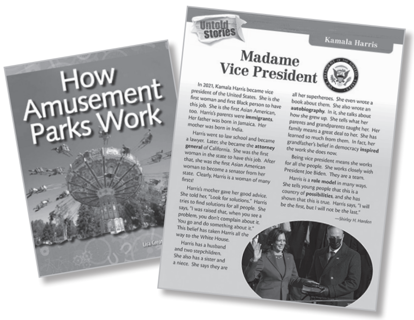
Theory in Practice

Language Power builds both interpretive and expressive modes of communication through varied instructional materials and guided tasks.

- The Before, During, and After Reading sections focus on important reading comprehension skills. Visual literacy is a big part of *Language Power* texts and lessons.
- The Writing activity provides opportunities for students to write for different purposes and share and display their work in creative ways.

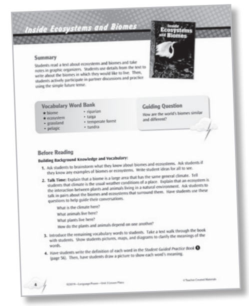


What's Included



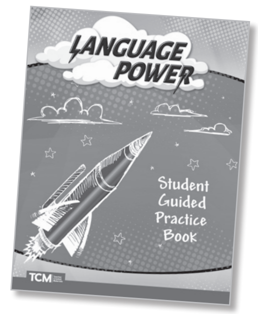
Themed Text Sets

The themed text sets include both books and text cards. There are 30 texts total.



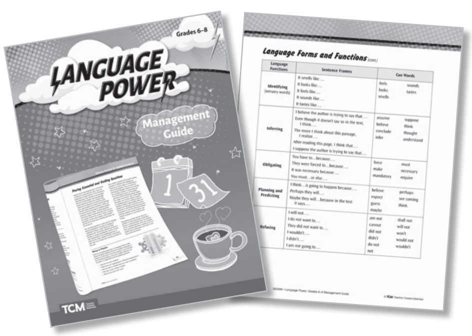
Lesson Plans

The lesson plans are provided in unit booklets to make thematic planning convenient and easy for teachers.



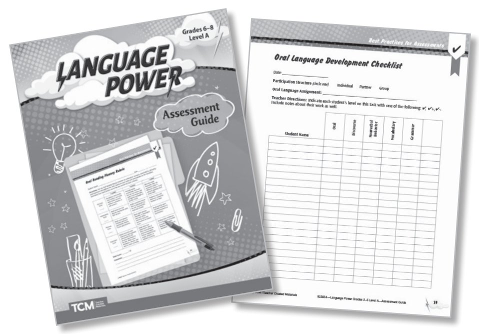
Student Guided Practice Book

Student activity pages help students interact with and produce language related to the thematic units.



Management Guide

This book provides important information about planning and the research base for the program.

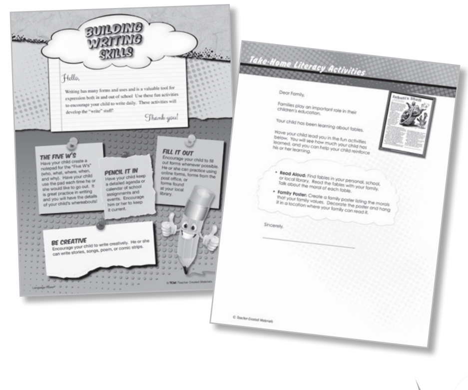


Assessment Guide

Important information, checklists, rubrics, and teacher directions for the assessments are provided in this book.

Digital Resources

All components of the program are provided digitally along with read-along ebooks. Students can use the digital tools to navigate the ebooks independently. The interactive features can be used to increase rigor and support students in extending their own knowledge. Videos and audio recordings allow students to approach texts through different modalities.



Planning

Pacing Plans

The following pacing plans show two options for using this resource. Customize these according to your students' needs or the time you have available to work with students.

Five-Day Plan

Instructional Time: 30 weeks, 5 days per week, 30 minutes per day

Notes: *Student Guided Practice Book* activities can be incorporated into instructional time or completed for independent practice. Adjust time spent on Before, During, and After Reading activities to accommodate text complexity and student needs.

Day 1	• Complete Before Reading activity • Begin During Reading activity
Day 2	• Finish During Reading activity • Complete After Reading activity
Day 3	• Complete Writing activity • Complete Fluency activity
Day 4	• Complete Content Connection activity • Begin Speaking and Listening activity
Day 5	• Finish Speaking and Listening activity • Complete Language Development activity

Three-Day Plan

Instructional Time: 30 weeks, 3 days per week, 45–60 minutes per day

Notes: Adjust the instructional time for each book, focusing more or less time on skills to meet the needs of students. Extend learning activities where most meaningful and/or have students complete assignments for independent practice.

Day 1	• Complete Before Reading activity • Complete During Reading activity
Day 2	• Complete After Reading activity • Complete Writing activity
Day 3	• Complete Speaking and Listening activity • Complete Language Development activity

Planning *(cont.)*

Program Scope and Sequence

READING									
	Grades K–2			Grades 3–5			Grades 6–8		
	A	B	C	A	B	C	A	B	C
Analyze author's craft and purpose.		✗	✗	✗	✗	✗	✗	✗	✗
Apply word analysis skills to decode.	✗	✗	✗						
Ask and answer questions about a text.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Demonstrate understanding of vocabulary.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Determine the main idea and supporting details of a text.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Making connections within and across texts.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Retell and/or summarize a text.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Understand narrative story features.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Understand text structure.		✗	✗	✗	✗	✗	✗	✗	
Use text features.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Use textual evidence to support opinions about a text.	✗	✗	✗	✗	✗	✗	✗	✗	✗

Program Scope and Sequence *(cont.)*

WRITING									
	Grades K–2			Grades 3–5			Grades 6–8		
	A	B	C	A	B	C	A	B	C
Explain and describe ideas about a topic.	✗	✗	✗	✗	✗				
Produce clear and coherent writing.							✗	✗	✗
Summarize and paraphrase information in texts.			✗	✗	✗	✗			
Use precise vocabulary to convey key ideas in writing.	✗	✗	✗	✗	✗	✗			
Write a narrative.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Write for different purposes.	✗	✗	✗	✗	✗	✗			
Write informational text.		✗	✗	✗	✗	✗	✗	✗	✗
Write opinions with supporting reasons.	✗	✗	✗	✗	✗	✗	✗	✗	✗

Planning *(cont.)*

Program Scope and Sequence *(cont.)*

SPEAKING AND LISTENING									
	Grades K–2			Grades 3–5			Grades 6–8		
	A	B	C	A	B	C	A	B	C
Demonstrate active listening.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Describe language used to present an idea.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Distinguish how different words affect an audience.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Express ideas clearly, and support ideas.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Plan and deliver oral presentations.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Retell texts and recount experiences.	✗	✗	✗						
Use general academic and domain-specific words appropriately.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Use language to persuade.	✗	✗	✗	✗	✗	✗	✗	✗	✗

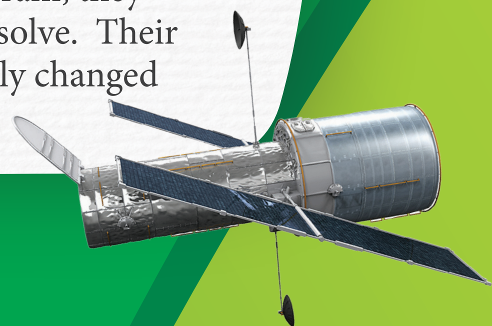
Program Scope and Sequence *(cont.)*

LANGUAGE DEVELOPMENT									
	Grades K–2			Grades 3–5			Grades 6–8		
	A	B	C	A	B	C	A	B	C
Demonstrate understanding of parts of speech.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Connect and combine ideas (discourse).	✗	✗	✗	✗	✗	✗	✗	✗	✗
Use connecting words and phrases.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Use morphology to determine the meanings of words.	✗	✗	✗	✗	✗	✗	✗	✗	✗
Use verbs or verb tenses to convey ideas appropriately.	✗	✗	✗	✗	✗	✗	✗	✗	✗

Note: The Grades 6–8 standards correlations are available in the Digital Resources. These charts include specific grade-level standards and the lessons that meet the standards within the three language proficiency levels. See page 64 for more information.

Designing a Shuttle

How can someone build a spacecraft that can take people and equipment into orbit and still be reusable like an airplane? That's what scientists and engineers had to figure out. When they started work on the space shuttle program, they had a problem to solve. Their solution completely changed space travel.



Creative Solutions

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Teacher Created Materials PUBLISHING

Reading Levels
Lexile®: 710L

ISBN-13: 978-1-4938-6701-1
90000
9 781493 867011
28916

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Smithsonian

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Library of Congress Cataloging-in-Publication Data

Names: Jordan, Elisa, author.
Title: Designing a shuttle / Elisa Jordan.
Description: Huntington Beach, CA : Teacher Created Materials, Inc., [2018] | Audience: Grades 4 to 6. | Includes index. | Description based on print version record and CIP data provided by publisher; resource not viewed.
Identifiers: LCCN 2018005459 (print) | LCCN 2018008920 (ebook) | ISBN 9781493869411 (E-book) | ISBN 9781493867011 (pbk.)
Subjects: LCSH: Space shuttles--Juvenile literature. | Space vehicles--Design and construction--Juvenile literature. | Aerospace engineering--Juvenile literature.
Classification: LCC TL795.515 (ebook) | LCC TL795.515 .J67 2018 (print) | DDC 629.47/4--dc23
LC record available at https://lccn.loc.gov/2018005459

Smithsonian

Teacher Created Materials
5301 Oceanus Drive
Huntington Beach, CA 92649-1030
www.tcmpub.com
ISBN 978-1-4938-6701-1

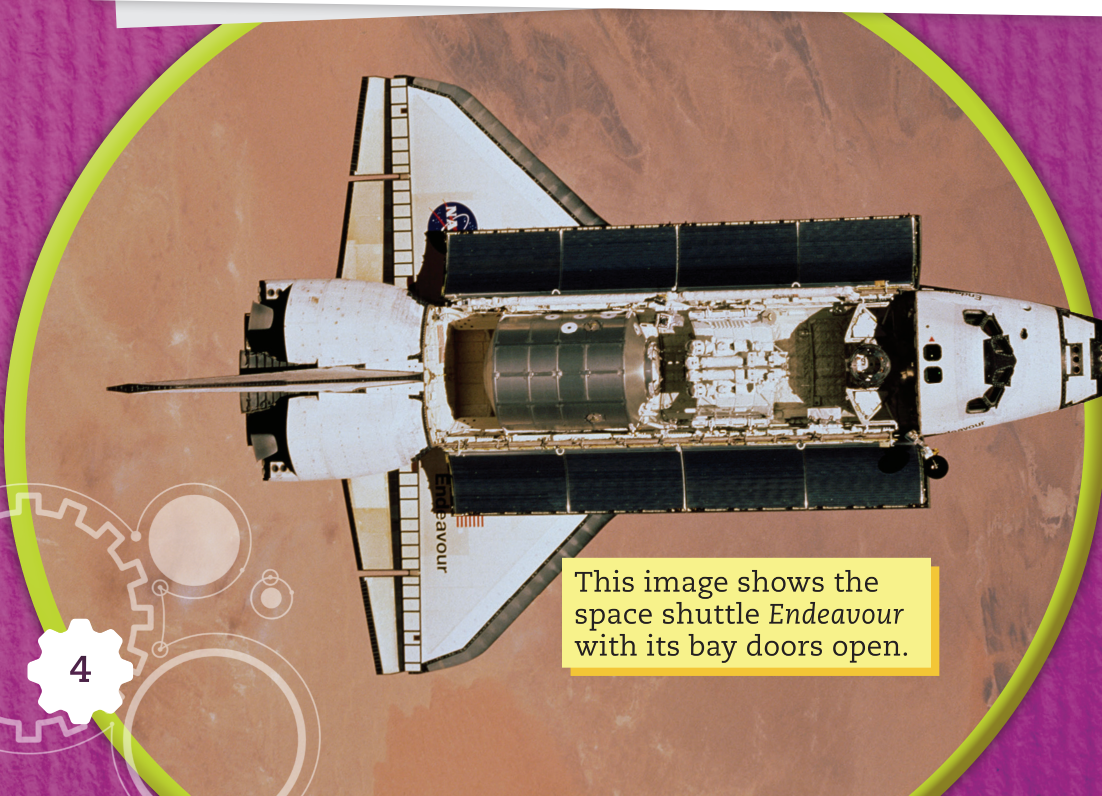
Table of Contents

Introducing the Space Shuttle!

In the early 1970s, the United States was the world leader in space travel. Americans landed men on the moon six times. The National Aeronautics and Space Administration (NASA) wanted to make more trips into space. But flying to space was expensive. Each trip used a new spacecraft. When a ship came back to Earth, it crashed into the ocean. It could not be used again.

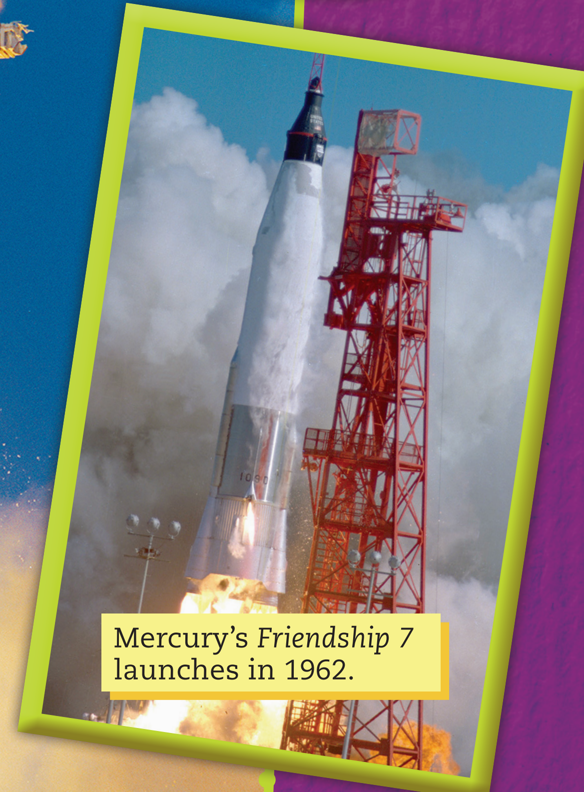
NASA wanted to build a new kind of spacecraft. Its goal was to design a craft that could be used over and over again. This would save money and make it easier to bring people and equipment to and from space. This goal turned into NASA's space shuttle program.

The space shuttle program came out of years of research. It took a long time for people and rockets to start launching people into space. Scientists and engineers had to figure things out one step at a time. Luckily, they had a long history to build on.



This image shows the space shuttle *Endeavour* with its bay doors open.

Apollo 16 launches in 1972.



Mercury's *Friendship 7* launches in 1962.

A single rocket launch in the 1960s cost NASA up to $375 million.

Long Ago

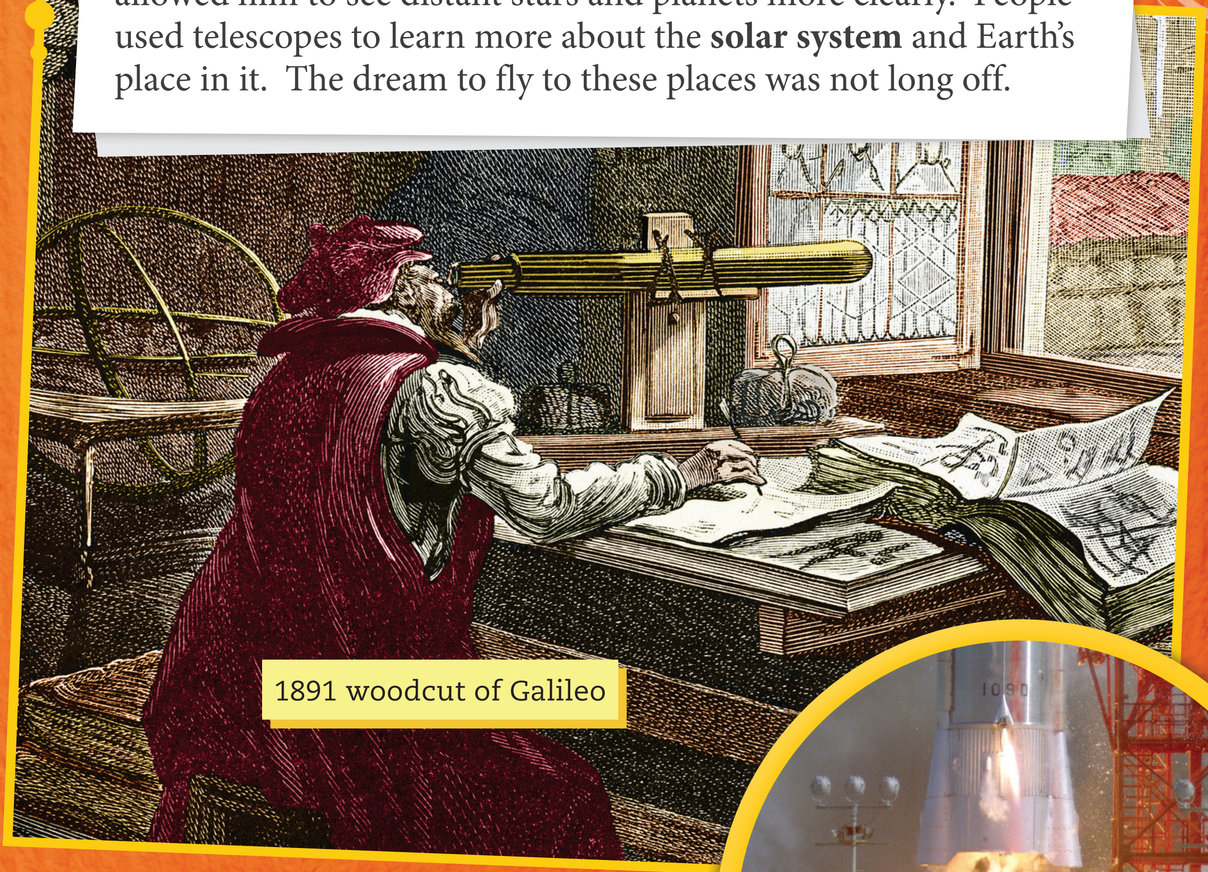
No one knows when the Chinese discovered the recipe for **gunpowder**. Around the year 900, they learned that if they made a small change to the recipe, gunpowder would burn instead of explode. This mixture was first put in bags tied to arrows. The arrows burned whatever they hit.

After a while, the bags were replaced with tubes. This changed everything. When the gunpowder burned, it pushed the arrow forward. The arrow flew farther. They didn't know it then, but these were the first rockets.

This print shows Chinese soldiers with flaming arrows.

gunpowder

Four hundred years later, Galileo Galilei (ga-lih-LEY-oh ga-lih-LEY) used a telescope to look into the night sky. This allowed him to see distant stars and planets more clearly. People used telescopes to learn more about the **solar system** and Earth's place in it. The dream to fly to these places was not long off.



1891 woodcut of Galileo

SCIENCE

Rocket Science

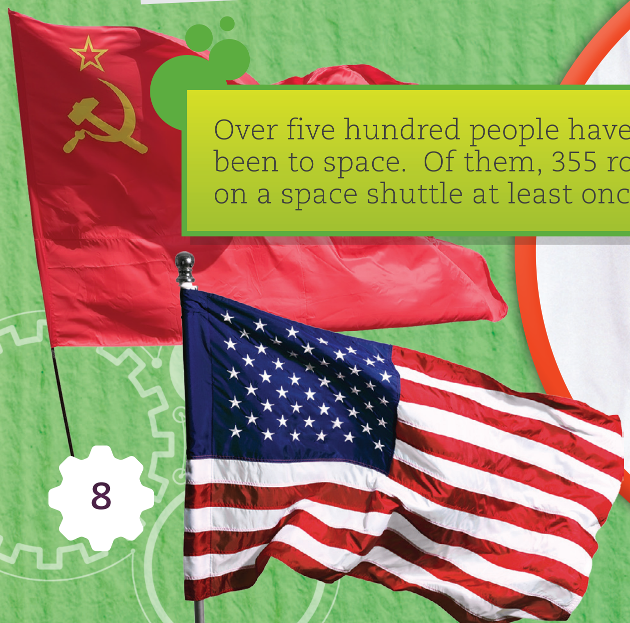
Rockets create **thrust** by burning fuel in a mostly sealed container. When fuel is burned, it turns into a gas and expands. Because it is in a sealed container, it can only escape from one place. Gas passes through a nozzle that helps control the rocket's direction. As gas escapes in that direction, the rocket moves in the opposite direction.

Space Race

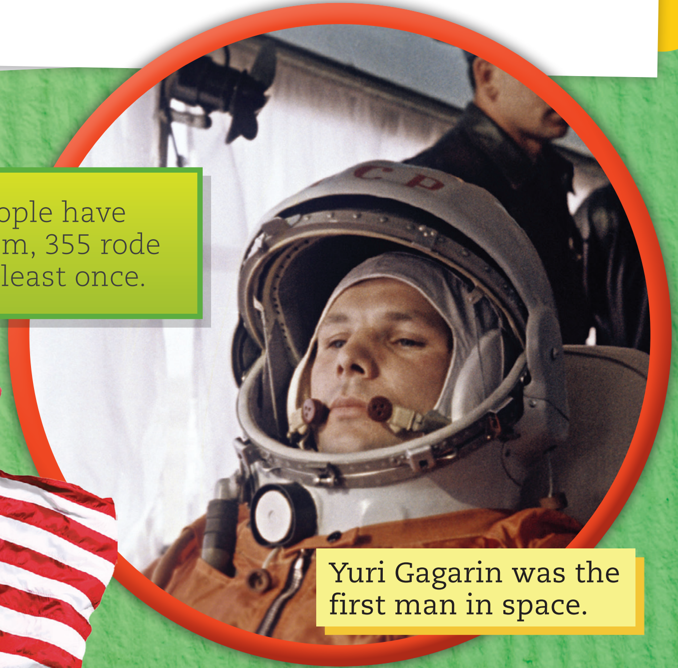
By the 1950s, scientists and engineers in the Soviet Union and the United States learned a lot about rockets. The two countries were rivals. They did not share data. People in each country wanted to prove their technical abilities.

In 1957, the team from the Soviet Union surprised the world when it put a **satellite** into orbit. The team from the United States worked hard to catch up. They wanted to be the world leader in space. Four years later, the Soviets struck first again when they sent a man into space. President John F. Kennedy challenged NASA to have an American walk on the moon before 1970. In July 1969, they did. The Soviets could not keep up. This was the end of the space race.

The space race taught scientists a lot. They knew astronauts could spend time in space safely. Research in space was now possible. The space shuttle program was started so NASA could send people into space more often. Rockets were expensive and could only be used one time. A new spacecraft that could be used over and over again would let NASA fly into space more often.

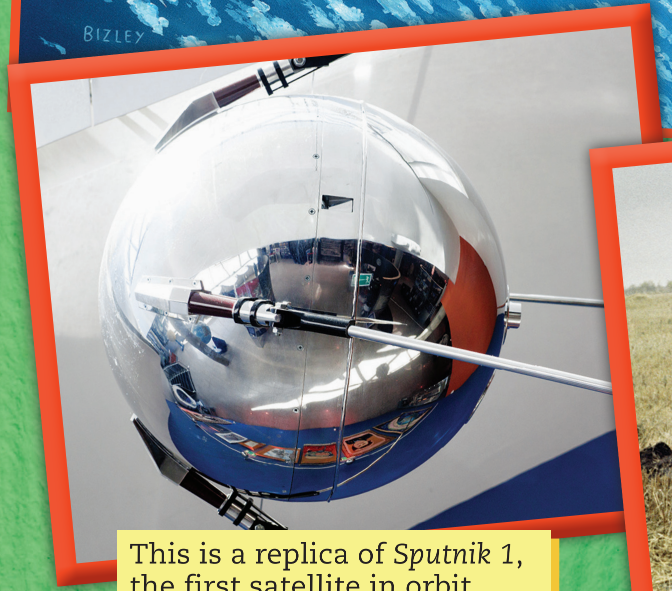


Over five hundred people have been to space. Of them, 355 rode on a space shuttle at least once.

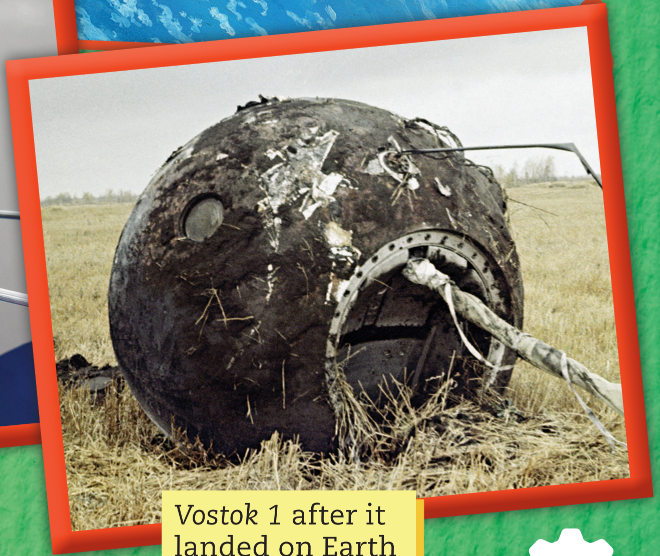


Yuri Gagarin was the first man in space.

This illustration shows *Vostok 1*, the craft that carried Gagarin.



This is a replica of *Sputnik 1*, the first satellite in orbit.



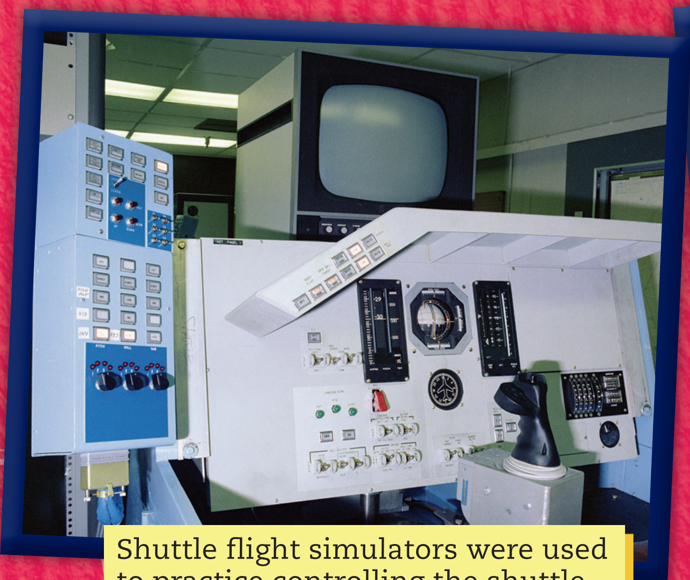
Vostok 1 after it landed on Earth

Designing the Space Shuttle

Once NASA decided to send people to space on shuttles, scientists and engineers had to design them. There were many questions that needed answers. What does a space shuttle look like? Would it have wings like an airplane? How would it carry enough fuel? How would it return to Earth?

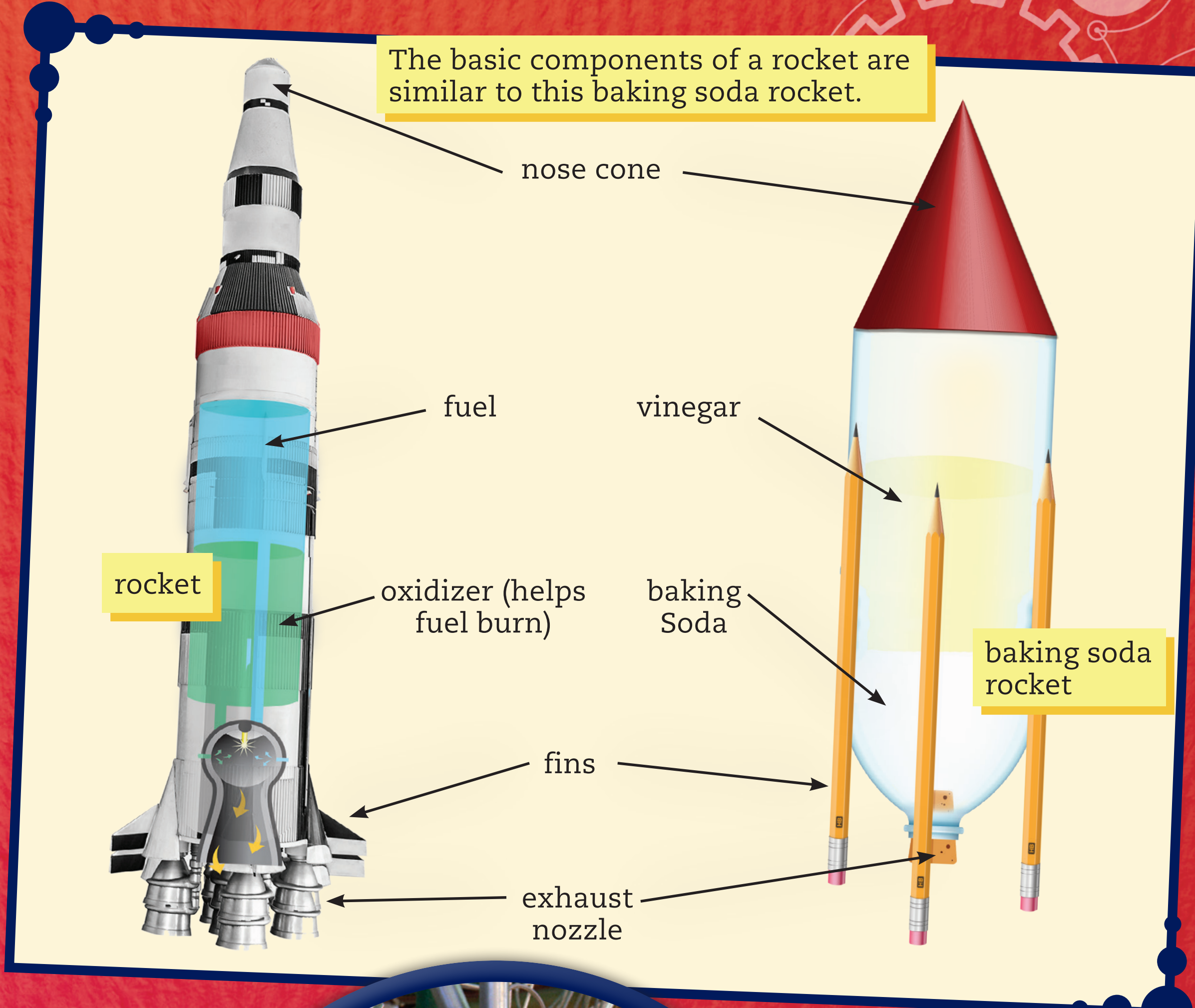
The team started to work on shuttles in 1972. The first space shuttle didn't launch until 1981. It took a long time to figure out how to make the ideas work for a real spacecraft.

First, scientists had to figure out everything a space shuttle needed to do. A space shuttle had to be strong enough to survive a launch into outer space. But it also needed to be light enough to fly. Astronauts were going to stay onboard. A shuttle had to be large enough to be their home. They were also going to work in the space shuttle. A lab had to be part of the design.


Shuttle flight simulators were used to practice controlling the shuttle.


A college student works in a space simulator underwater.

The basic components of a rocket are similar to this baking soda rocket.

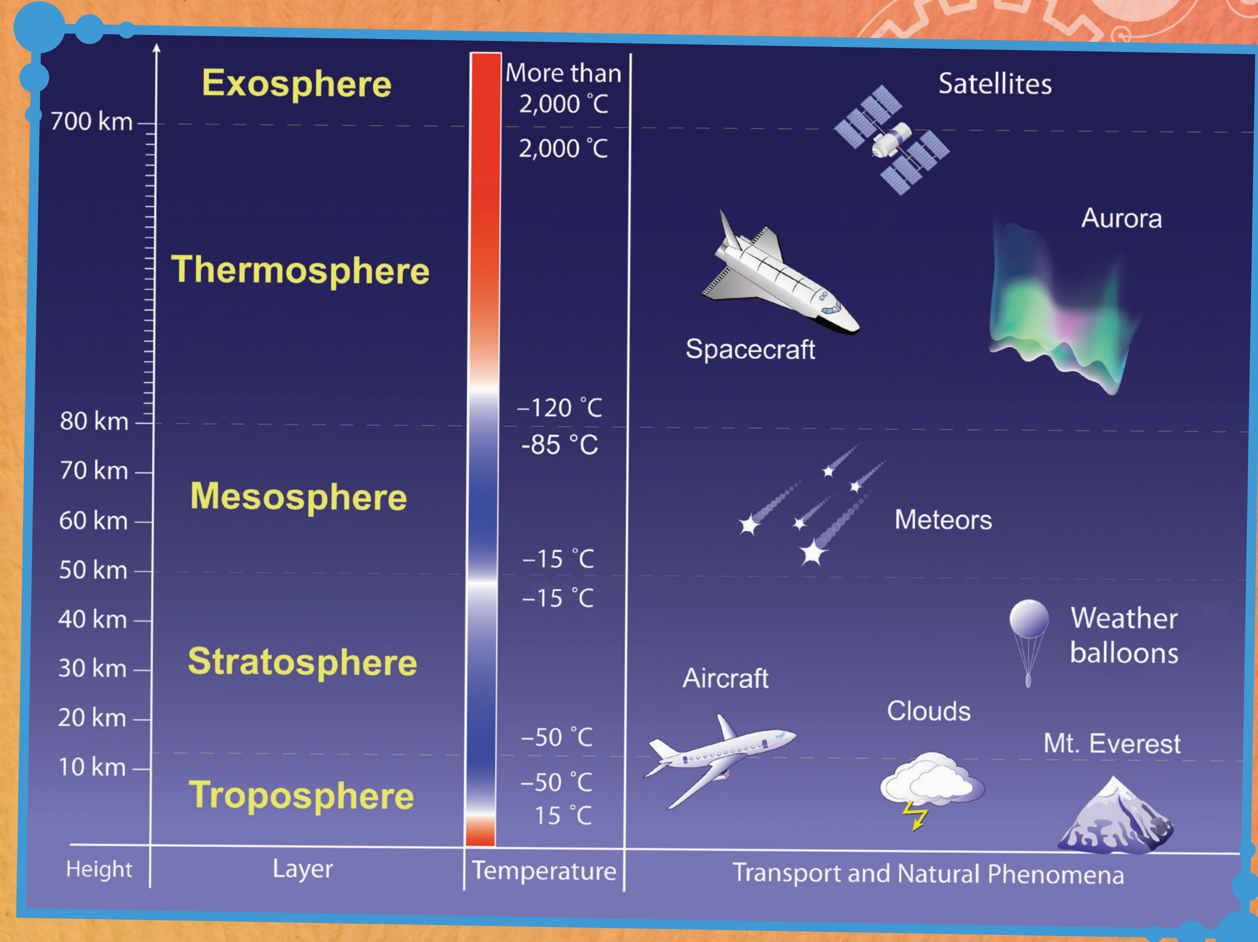


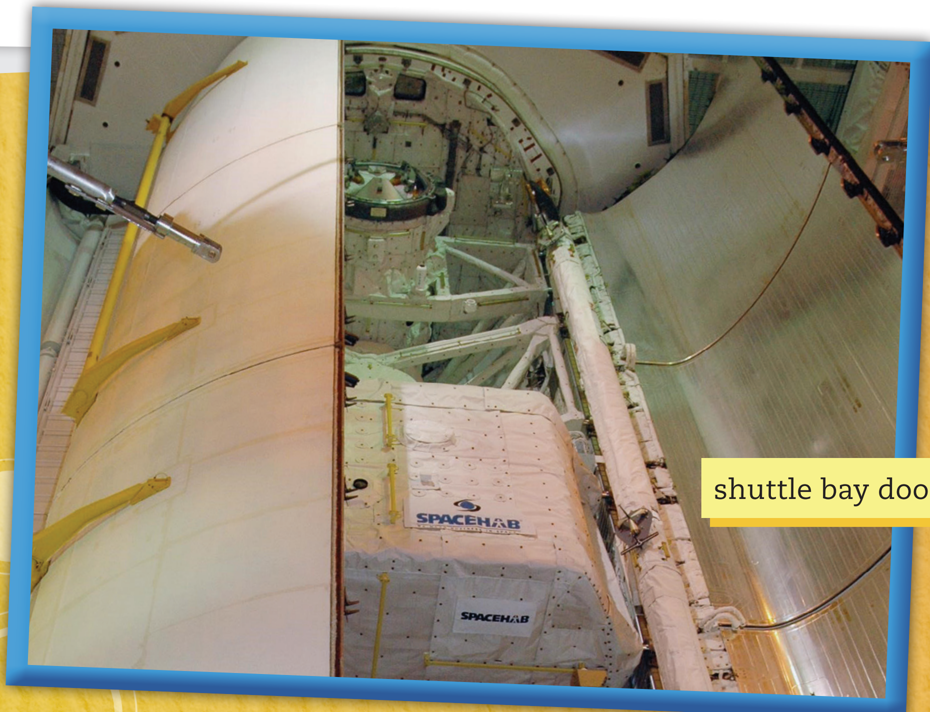

A rocket engine is tested to provide data to help design shuttle engines.

Hot Topic

The team thought about many details. Engineers started drawing what a space shuttle might look like. The first designs looked like an airplane. But airplanes are not meant to fly outside of Earth's stratosphere. The shuttle would need an outside rocket system to get it past the stratosphere. External tanks would hold the fuel and oxygen the shuttle would need. So, the shuttle became a glider. A NASA team also realized that the shuttle had to **withstand** extreme heat. Some materials change shape when they get hot. This is called thermal distortion. It is what happens when shuttles reach the thermosphere.

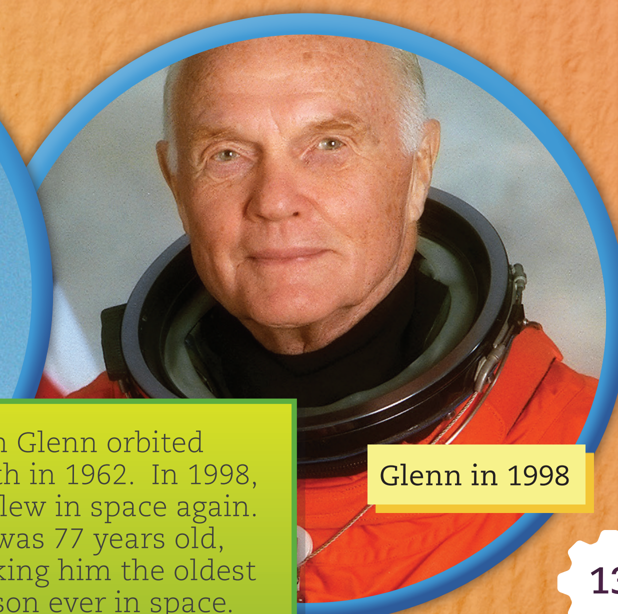
Scientists found that shuttle bay doors were affected by thermal distortion. Engineers figured out how to make bay doors that would not break when flying through the thermosphere. They added special closures. They made the doors more **flexible**. They could hold up to changing temperatures and still function.





shuttle bay doors

Glenn in 1962



Glenn in 1998

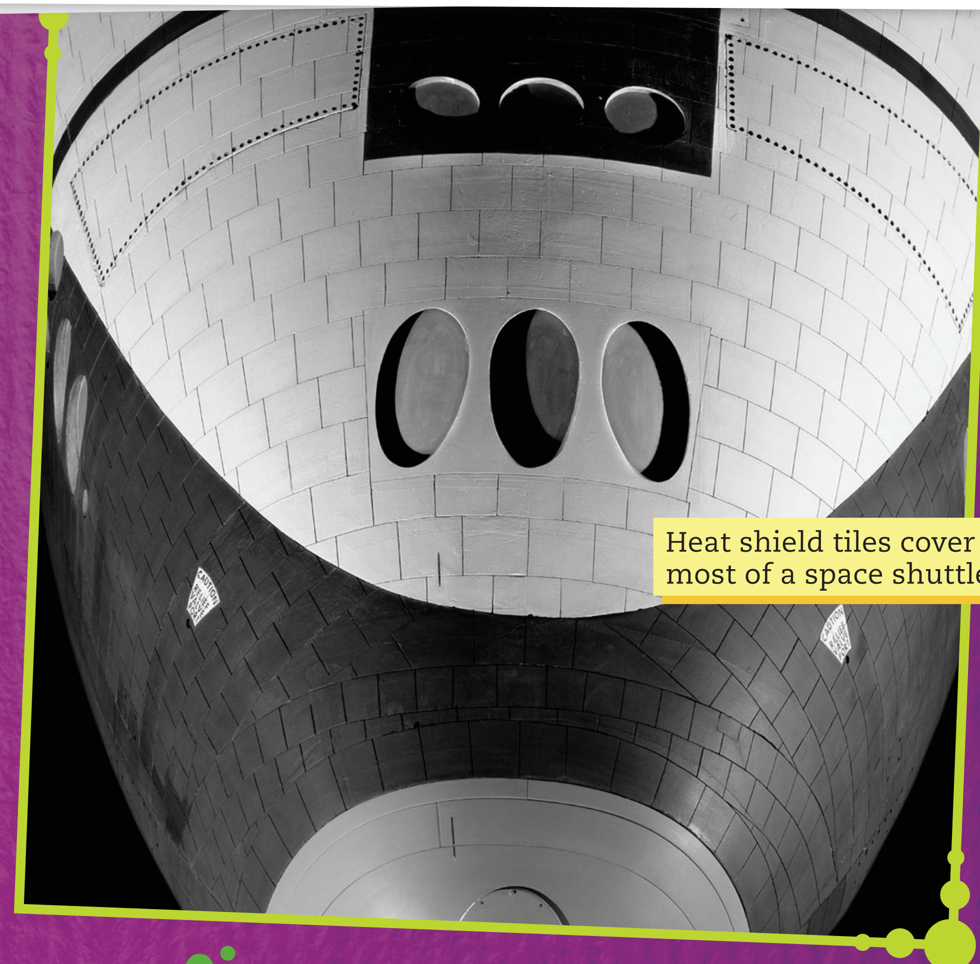
John Glenn orbited Earth in 1962. In 1998, he flew in space again. He was 77 years old, making him the oldest person ever in space.

Next, engineers had to figure out how to make the whole space shuttle withstand heat and be flexible, too. They had to design a cover that would flex but not break. This cover is called the skin. Since the shuttle would be used again, the skin needed to be strong and able to withstand high temperatures.

Silica tiles are cut to fit like a skin.

Tiles are tested in ovens to learn how they work during re-entry.

The design team thought of many ideas. They had to choose which idea would work best. They finally decided that small tiles made of silica would work. Silica is found in sand and in quartz. It is used to make glass. The small tiles allowed the shuttle's body to flex during launch or in space if it needed to. One large skin would crack. So more than 25,000 smaller silica tiles were used!



Heat shield tiles cover most of a space shuttle.

Scientists and engineers look at more than 20 different weather conditions, including temperature and cloud cover, to decide whether a launch can happen.

Combining New and Old

A lot of new ideas were used to build the space shuttle. But engineers also relied on some old ideas. **Aluminum** is a material used to build airplanes. Engineers decided to use it on the shuttle because it is strong. It is also lightweight and flexible.

Traveling in space shuttles is not the same as on airplanes. People stay in seats on airplanes. When they get up, they can walk around. But in space, people float! This can make even simple tasks much more difficult.

An astronaut eats in space.

shuttle toilet

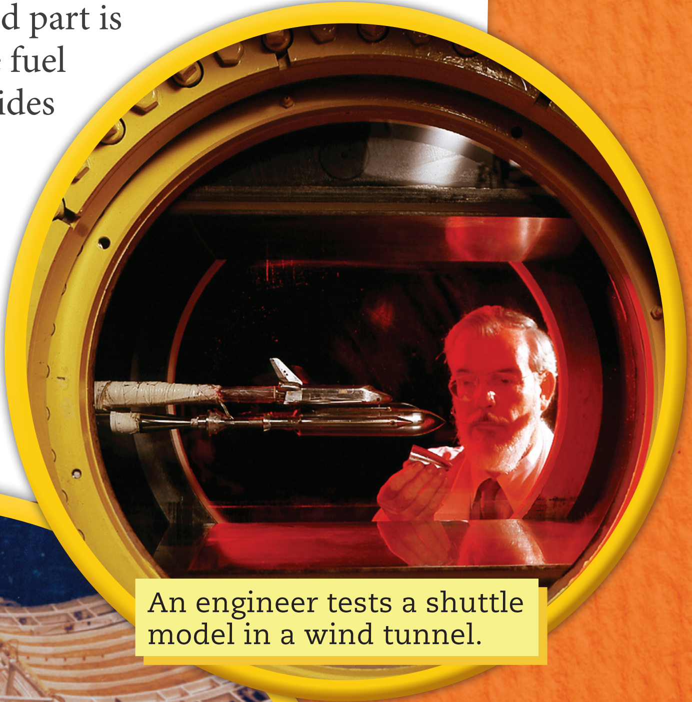
The scientists and engineers who designed the shuttle made sure astronauts had places to sleep. Like people on Earth, astronauts need to sleep at least eight hours. If astronauts don't want to bump into things while they are sleeping, they have to attach themselves to something. There were beds and sleeping bags for them. They could also sleep sitting in their seats.

Astronaut Sally Ride sleeps in a restraint.

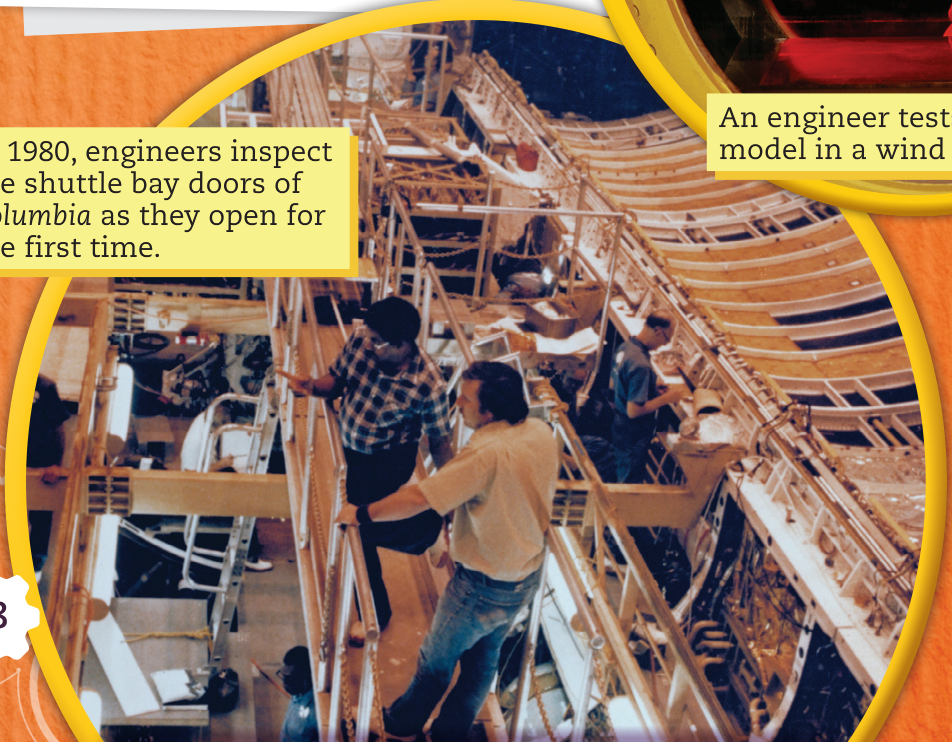
British scientist Sir Isaac Newton was the first person to identify gravity.

The engineers and scientists who designed the shuttle created something completely new. But it took them many tries. They had to think of many ideas. Then, they had to test those ideas. Even if the tests were successful, they often made improvements to the designs. Sometimes, they had to start over! After all their tests, the space shuttle had three main parts.

The first part of a space shuttle is called the **orbiter**. This part looks like an airplane. It is the only part of the shuttle that launches into space. The second part is called the external tank. It is a large fuel tank attached to the orbiter. It provides fuel to the engines. The third part of the shuttle is the **solid rocket booster**. There are usually two of them. They are tall, skinny rockets on both sides of the orbiter. The boosters are the engines that help push the orbiter off the ground and into the air.

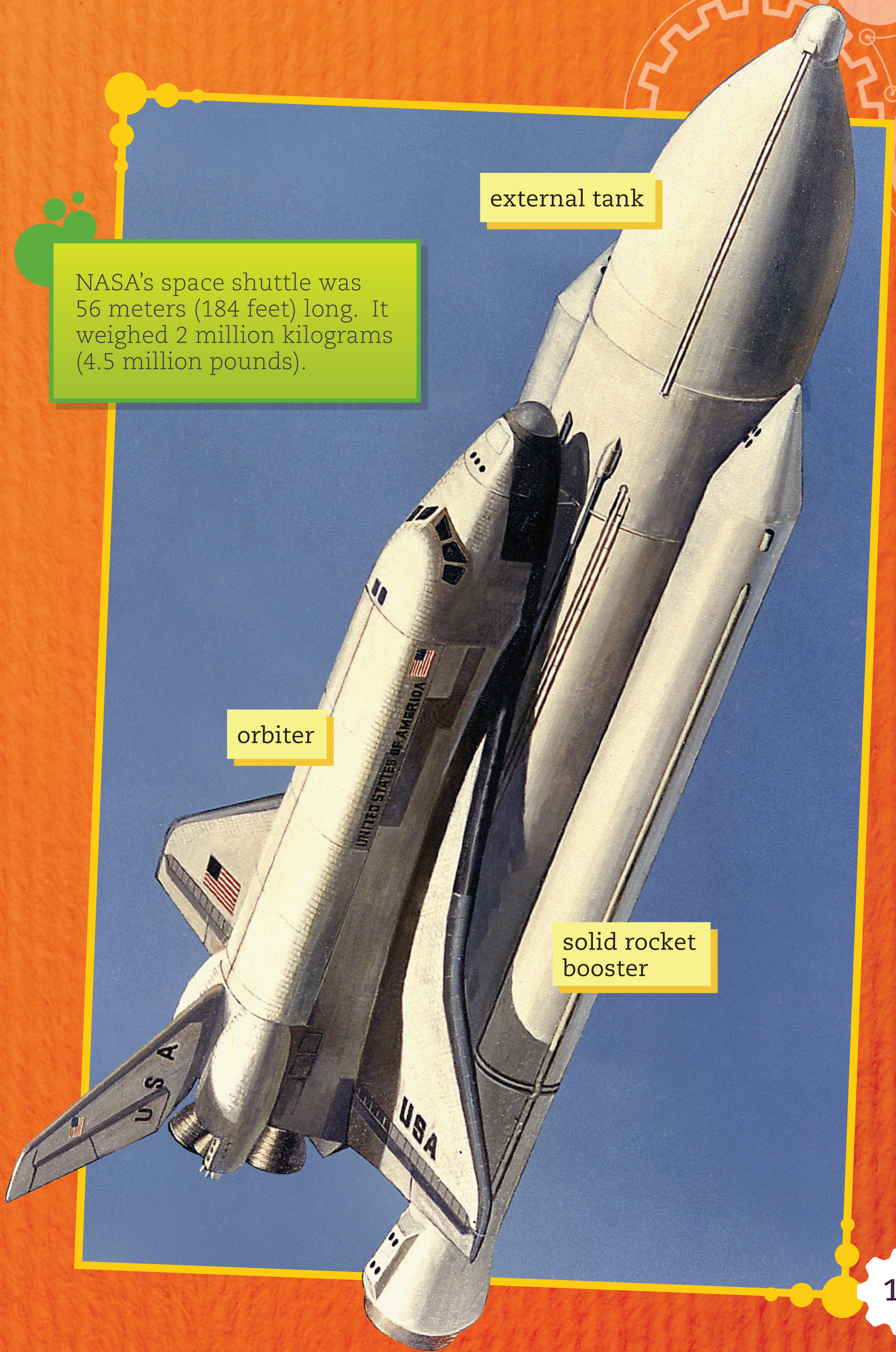


An engineer tests a shuttle model in a wind tunnel.



In 1980, engineers inspect the shuttle bay doors of *Columbia* as they open for the first time.

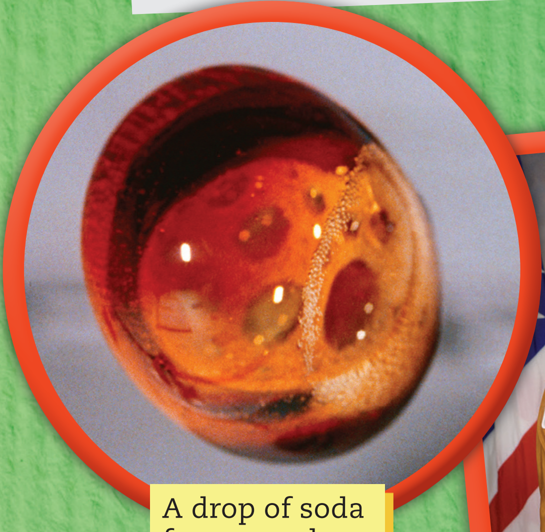
NASA's space shuttle was 56 meters (184 feet) long. It weighed 2 million kilograms (4.5 million pounds).



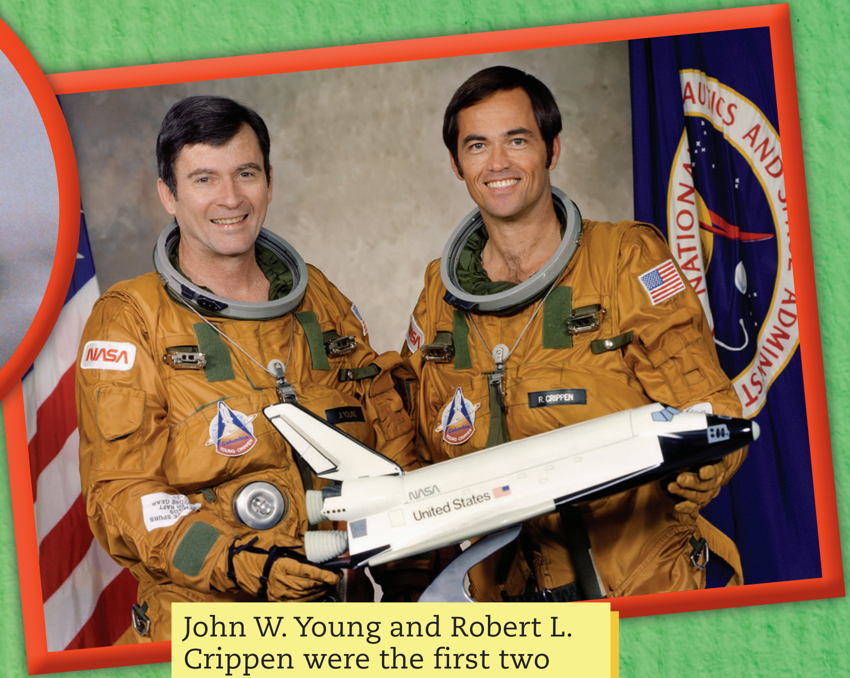
Shuttle Missions

The first space shuttle mission took place in 1981. It was very exciting to see its launch after years of hard work! The space shuttle could carry seven people. Astronauts had a lot of work to do. They studied many things, such as gravity and weightlessness. Scientists wanted to see how **cells** change in new places. Seeing how cells change helps scientists understand how cells work. That can lead to better medicines.

Astronauts also studied how liquids act in space. Gravity changes many of the properties of liquids on Earth. In space, liquid forms spheres. Boiling water on Earth causes bubbles to rise to the surface of the water. In space, the lesser effect of gravity means gas will not rise to the top when liquids boil. Instead, bubbles just grow larger and larger at the heat source.



A drop of soda forms a sphere while in space.



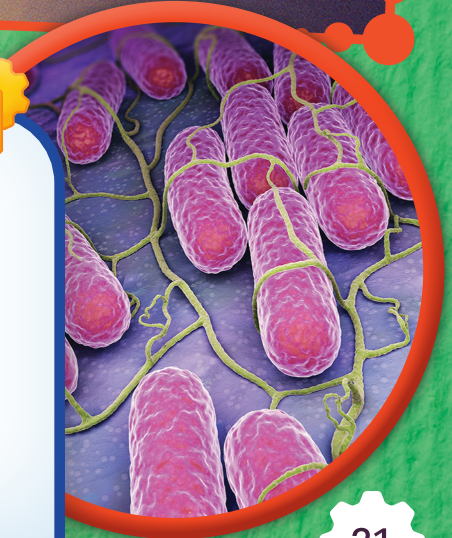
John W. Young and Robert L. Crippen were the first two astronauts to fly in a shuttle.

Space shuttle *Columbia* launches in 1981.

TECHNOLOGY

Medical Breakthrough

Astronauts tested *Salmonella* bacteria on the space shuttle. People can get very sick from it on Earth. In space, the bacteria got stronger. Scientists believed this happened because space "tricked" it. The bacteria thought it was inside a person's body. Scientists watched it and did tests. They invented a vaccine to help people get better on Earth.



There were 135 space shuttle missions from 1981 to 2011. One of the most important goals of the program was to build the International Space Station (ISS). The ISS is very big. In fact, it's the largest object ever flown in space. Sometimes, people can see it from Earth.

The United States and 15 other countries helped build the ISS. It orbits Earth 16 times per day. Astronauts from around the world live and work on the ISS, usually in crews of six, so they can learn more about space. Some of the space shuttle's missions were to add or repair parts on the ISS.

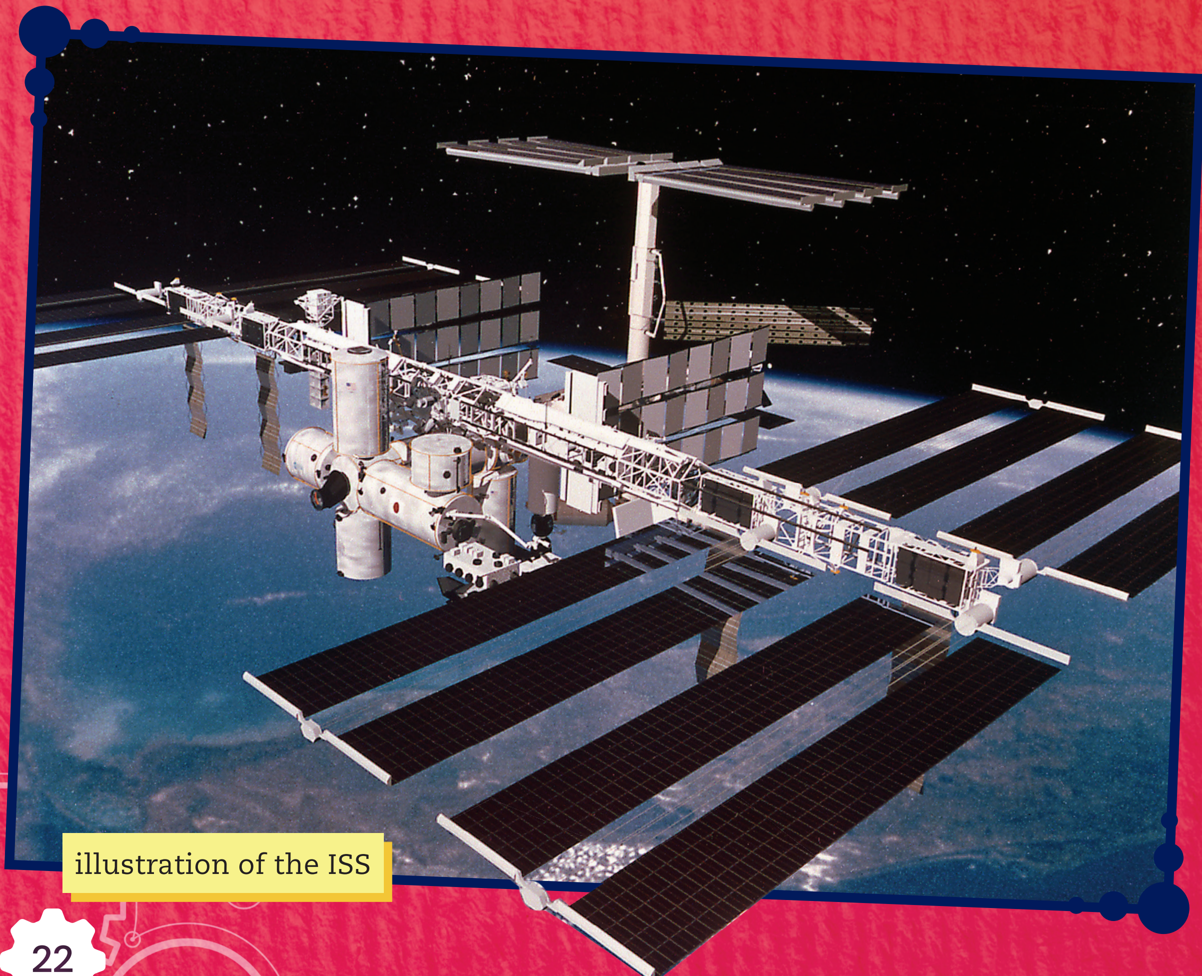
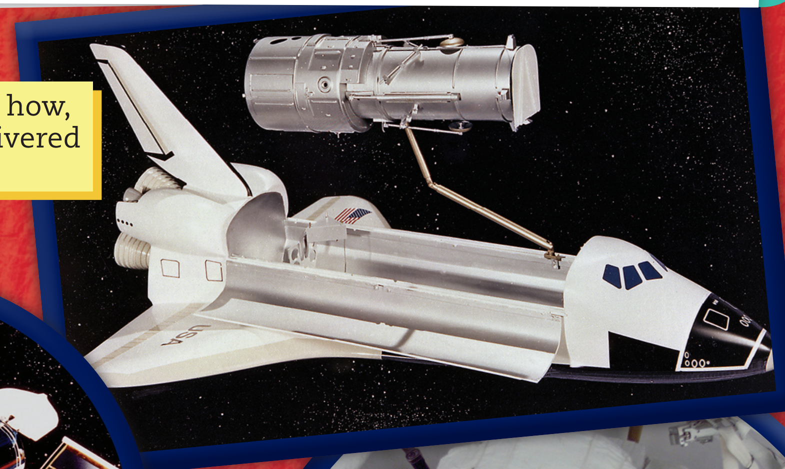


illustration of the ISS

The space shuttle also launched the Hubble Telescope. It can see a lot! It has made more than a million observations since it launched. Like any piece of equipment, the Hubble sometimes needs to be fixed. The space shuttle crew repaired and updated it during five service missions.



This illustration shows how, in 1990, the shuttle delivered the Hubble into space.

Hubble Telescope

This astronaut was the first to leave the ISS through an airlock.

ENGINEERING

Airlock Chamber

Astronauts use an airlock chamber to enter and exit a shuttle while it is in space. It is an airtight room with two doors. One door leads outside, and the other leads back into the shuttle. Astronauts go into the airlock and shut the door behind them. Then, they get dressed for their spacewalks. When they are dressed and ready, they release air from the airlock so they can open the door that leads outside.

Legacy of the Space Shuttle

In the past, explorers traveled on land to see what was beyond the **horizon**. Then, they traveled by sea to see what was across the oceans. Astronauts are explorers, too. They want to see what is beyond our planet.

NASA wanted to honor the explorations of the past. It named all the shuttles after ships whose voyages helped make many discoveries in science.

The first space shuttle was named *Enterprise*. It never flew in space. The first shuttle to go to space was *Columbia*. The space shuttles after that were *Challenger*, *Discovery*, *Atlantis*, and *Endeavour*. All the space shuttles discovered new things about science just like the ships they were named after.

Thanks to the space shuttle program, we know a lot more about space flight. The program expanded the range of useful activities that people can do in space. They also built better equipment and spaces where astronauts can live and work.

The original *Star Trek* television series called space the "final frontier." It is! There is still so much to explore in space.

Columbia lands after its first mission in 1981.

Challenger lands after a 1985 mission.

The crew of *Discovery* pose for a photo in 2000.

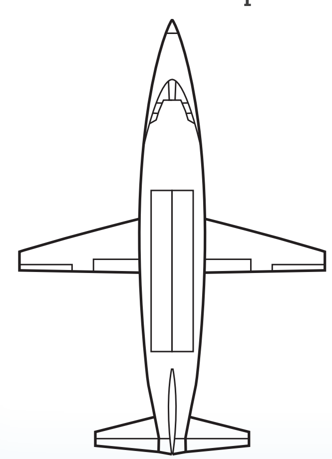
This is an image of *Endeavour* taken from the ISS in 2009.

ARTS

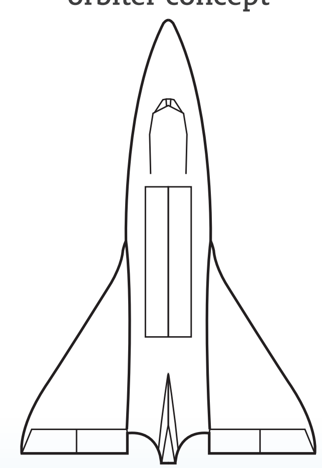
Choosing the Delta Wing

A space shuttle is like a rocket, but it is also like an airplane. Look closely—there are differences between the wings of most planes and space shuttles. Some airplanes have straight wings. Shuttles have **delta wings**. Engineers used delta wings on the shuttle because they produce more lift to glide longer. This allows the shuttle to move more easily. Also, vehicles with delta wings do not heat up as much when they come back to Earth.

straight-wing orbiter concept



delta-wing orbiter concept



NASA ended the space shuttle program after 30 years and 135 missions. The program was supposed to last for 15 years. But it lasted twice as long. It was time to try something new.

Overall, the program was a success. But there were two shuttle accidents. One shuttle broke apart right after takeoff. Another broke apart 16 minutes before landing. Sadly, the crew members of both missions did not survive.

When the space shuttle program ended, NASA had four space shuttles left. These space shuttles are part of history. No one wanted to destroy them. Where could they go? Four museums around the country became their new homes.

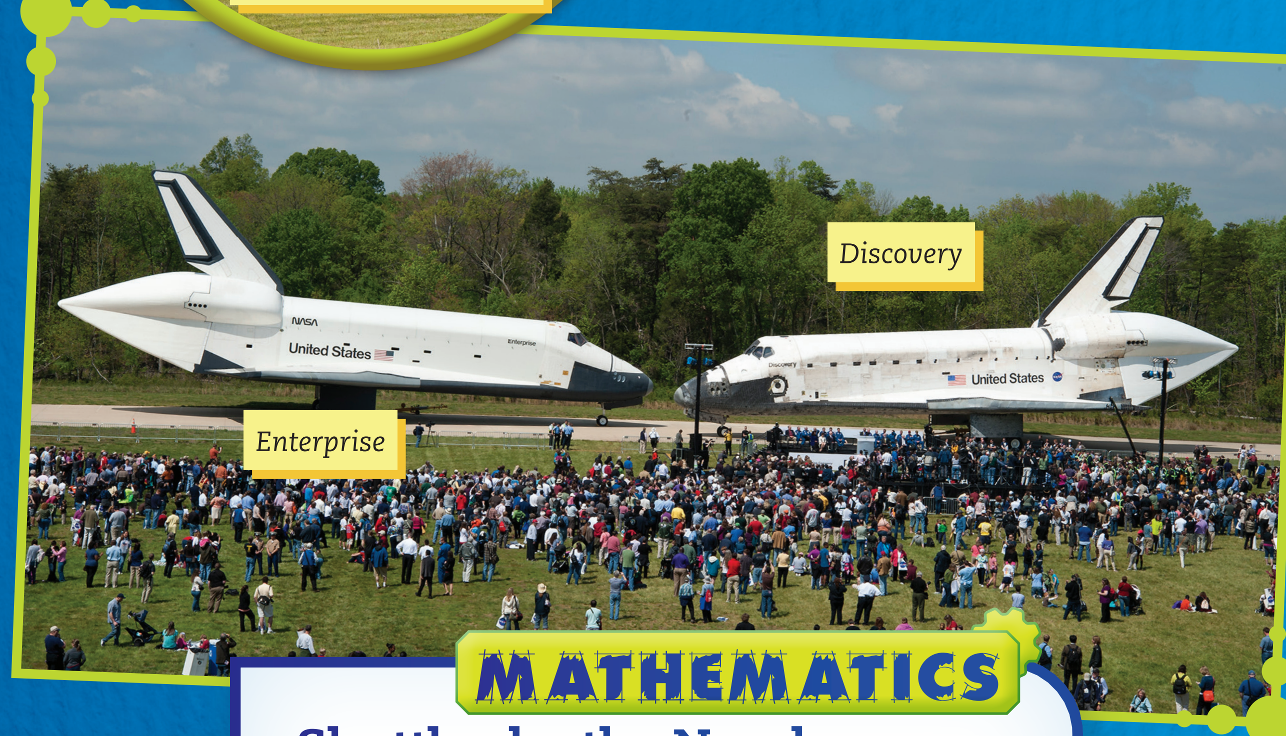
One space shuttle is displayed at Smithsonian's National Air and Space Museum. Another is at a museum in New York City. A third shuttle is now at a science center in Los Angeles. The last one is at the Kennedy Space Center in Florida. Visitors can now see these amazing shuttles in person!

An astronaut stands on the flight deck of *Discovery*.

The last shuttle flight carried a large container of student experiments.

Discovery lands after its final mission.

Enterprise is flown to a New York airport.



Discovery

Enterprise

MATHEMATICS

Shuttles by the Numbers

During the program's 135 missions, the space shuttles did many things. They carried over 1,500 tons of cargo into space. They spent a total of 1,323 days in space and orbited Earth 20,830 times.

STEAM CHALLENGE

Define the Problem

An engineer's first design is rarely the best solution to a problem. When designing something as large as a space shuttle, engineers often make small models to test their designs. Your task is to build a model shuttle that can be successfully launched with a straw.

Constraints: Your model may only use one sheet of paper and tape.

Criteria: The paper shuttle must go at least 1 meter (1 yard) when launched by blowing through a straw.

1 Research and Brainstorm

What wing shape will work best? How many wings will work best? Where should the wings be placed? What forces are acting on your shuttle?

2 Design and Build

Sketch your design including measurements for each part of your model shuttle. Build the model.

3 Test and Improve

Launch your paper shuttle from your straw three times. Did your shuttle go 1 m (1 yd.) or more? Did your shuttle design provide consistent results? Get feedback. Modify your design and try again.

4 Reflect and Share

What factors affected your shuttle's flight pattern? How can you minimize the effects of these factors? Will other types of materials improve the results?

Glossary

aluminum—a type of shiny, silver metal that comes in many forms, such as foil

cells—the basic building blocks of all living things

delta wings—triangular, swept-back wings

flexible—able to be bent

gunpowder—an explosive mixture used in guns and explosives

horizon—the line where the sky seems to meet the earth or sea

orbiter—the part of the space shuttle that went into space and looks like an airplane

satellite—a machine that is launched into space and moves around Earth or another body in space

solar system—a star with bodies, such as moons and planets, revolving around it

solid rocket booster—a solid fuel engine that helped push the orbiter into space

thrust—the force that drives something forward

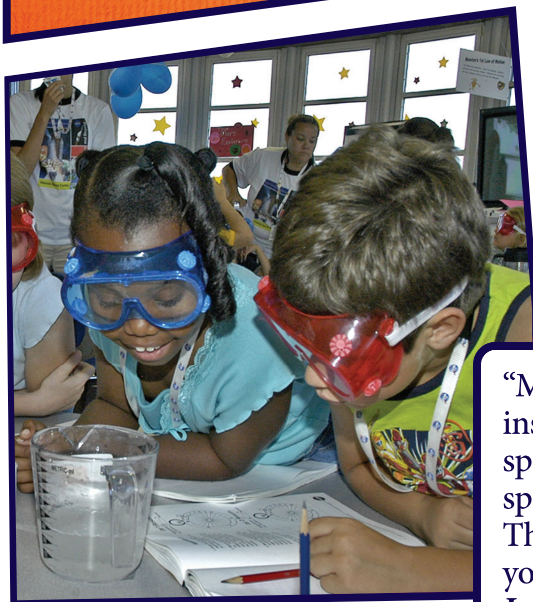
withstand—to stand against or resist

Index

CAREER ADVICE
from Smithsonian

Do you want a career in space?
Here are some tips to get you started.

"NASA hires people with many different interests. I started out writing about science and technology for NASA. Whatever you like to do, there is a future space career for you!" *—Dr. Valerie Neal, Space History Curator*



"Museums are committed to teaching and inspiring students. Visit as many air and space museums as possible. Learn about spacecraft by listening to museum guides. They are experts in their field. They can help you find where your passion lies." *—General John "Jack" Dailey, former National Air and Space Museum Director*

LANGUAGE POWER

Grades 6–8
Level C

Unit 7

Space

- We Are Here
- From Hubble to Hubble: Astronomers and Outer Space
- The Evolution of Space Suits
- Designing a Shuttle
- The Moon

Essential Question

How has studying space led to technological advancements?

Talk About It!

Would you want to travel to space? Why or why not?

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Objectives

Unit 7: Space

Standards are integrated within each lesson to enable multilingual learners to work toward proficiency in English while learning content—developing the skills and confidence in listening, speaking, reading, and writing. The learning objectives listed here describe the skills and strategies presented throughout the lessons.

We Are Here Objectives

Reading: Students will integrate information presented in different text features, media, or formats as well as in words.

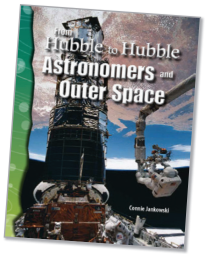
Writing: Students will produce clear and coherent writing that is appropriate to task, purpose, and audience.

Content Area—Science: Students will examine celestial bodies and the scale of the solar system, galaxy, and universe.

Speaking and Listening: Students will justify opinions by providing detailed relevant evidence.

Language Development: Students will use nominalization to condense ideas and create precise and detailed sentences.

From Hubble to Hubble: Astronomers and Outer Space Objectives



Reading: Students will answer questions about key details of a text, referring explicitly to the text as the basis for the answers.

Writing: Students will draw evidence from an informational text to support analysis and reflection.

Content Area—Science: Students will examine how people of all backgrounds and with diverse interests, talents, qualities, and motivations engage in fields of science and engineering.

Speaking and Listening: Students will use general academic and domain-specific words, synonyms and antonyms, and non-literal language to create precision and shades of meaning while speaking.

Language Development: Students will use knowledge of prefixes and linguistic context to determine the meanings of unknown words and use them appropriately.

The Evolution of Space Suits Objectives

Reading: Students will summarize and paraphrase information in texts, including important details of a text.

Writing: Students will write narratives to develop imagined experiences using relevant descriptive details.

Content Area—Science: Students will examine the design process as it relates to space suits.

Speaking and Listening: Students will explain how figurative language produces shades of meaning, nuances, and different effects on the audience.

Language Development: Students will join ideas using transitional words and phrases.

Designing a Shuttle Objectives

Reading: Students will determine the main idea of the text and recount the key details.

Writing: Students will write arguments to support claims with clear reasons and relevant evidence.

Content Area—Science: Students will examine the design process as it relates to the space shuttle.

Speaking and Listening: Students will adjust language choices according to purpose and audience.

Language Development: Students will use the simple present tense to convey ideas appropriately.

The Moon Objectives

Reading: Students will determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings.

Writing: Students will produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Content Area—Language Arts: Students will examine the use of language in literary works to convey mood, images, and meaning.

Speaking and Listening: Students will use figurative language to produce shades of meaning, nuances, and different effects on the audience.

Language Development: Students will identify and explain similes and metaphors.

Designing a Shuttle

Lesson Summary

Students read a text about the design of space shuttles. They identify details that support one of the main ideas of the book. They write arguments about the success or failure of the program. Then, students adjust their language choices to suit different scenarios, and they practice using the simple present tense.

Vocabulary Word Bank

- aluminum
- delta wings
- ★ flexible
- ★ legacy
- orbiter
- solid rocket booster
- thrust
- ★ withstand

Guiding Question

How did designing the space shuttle lead to other advancements and technology?

Before Reading

Building Background Knowledge and Vocabulary

1. Take a text walk through the book, and show students some of the pictures and diagrams. Ask students to predict what the text will be about. Then, tell students they are going to learn about how space shuttles were designed. Review what space shuttles are and how they were used.
2. Preview the vocabulary words with students. Read the words aloud. Share the vocabulary picture cards provided in the Digital Resources, if needed, to connect to students' prior knowledge. Then, discuss the different ways in which something or someone can be *flexible* (e.g., a material can be bendable, and a person can be willing to change plans).
3. **Talk Time:** Have students write questions they have about space shuttles in the *Student Guided Practice Book* ❶ (page 116). Challenge students to write questions using each question word—*who*, *what*, *when*, *where*, *why*, and *how*. Have students share their work with partners.

During Reading

1. Read the first four pages to students to model proper pacing, intonation, and expression.
2. **Talk Time:** Have students read the remainder of the text in pairs. (A copy of the book is provided online in the Digital Resources.) Then, have students revisit page 116 in the *Student Guided Practice Book*. Have student pairs answer each other's questions now that they have read the text.
3. **Talk Time:** Discuss with students that engineering involves designing solutions for problems that have specific requirements. Have students work in pairs to complete the activity sheet in the *Student Guided Practice Book* ❷ (page 117). Discuss student answers as a class.

After Reading

1. **I Do:** Ask students to refer to the activity sheet in the *Student Guided Practice Book* ❸ (page 118). Explain to students that they will identify details that support the main idea listed on the page. Tell students that to do this, they will find examples of discoveries and technology that were made as a result of the space shuttle program. Turn to page 20 of the text. Model how to identify and summarize the key accomplishments in each category:

   On page 20, I see information about the kinds of things astronauts studied on the space shuttle. It says that they studied gravity and weightlessness. They also studied how cells change in space, which helps them understand how cells work. They studied how liquids act in space and how that affects the boiling process. I can write these details in the first box because these discoveries helped people better understand scientific ideas.

2. **We Do:** Guide students in identifying details of technologies that were created because of the space shuttle program. Use the following questions to help guide your discussion:

   What does page 21 say about technology breakthroughs?

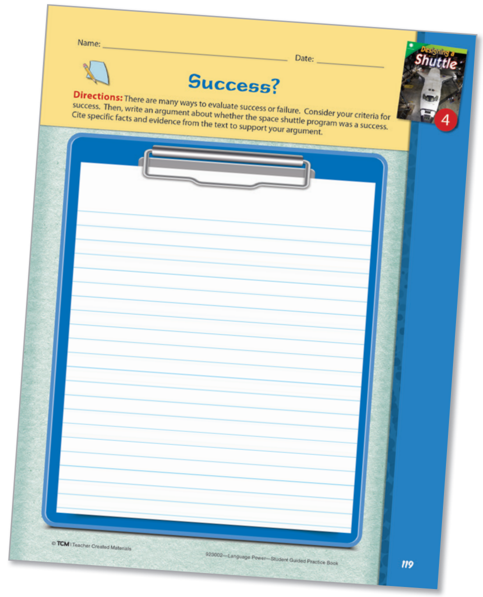
   What information can you find on page 23 about advances in engineering due to the shuttle program?

   Progress Check: During Step 2, listen for students identifying details that support the main idea.

3. **You Do:** Have students complete the activity independently. Then, have them share their work with partners.

Writing

As a class, discuss criteria for success. Brainstorm ways to measure the success or failure of the space shuttle program, such as meeting goals, contributing to scientific advancements, or ending the program. Then, have students each write a paragraph arguing whether the shuttle program was a success in the *Student Guided Practice Book* ❹ (page 119). Remind them to cite specific facts and evidence from the text to support their argument. Encourage them to use their previous activity sheets to help them find information.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Success?

Directions: There are many ways to evaluate success or failure. Consider your criteria for success. Then, write an argument about whether the space shuttle program was a success. Cite specific facts and evidence from the text to support your argument.

119

Fluency

Have pairs of students take turns reading a page aloud three times.

Note: Checklists and rubrics to assess fluency and language development are provided in the Digital Resources.

Content Connection

Have students work in small groups to complete activity pages 28–29 of the book. Hold a contest to see which design is most successful. Then, discuss students' design processes.

Take-Home Literacy Activities

The Digital Resources include both English and Spanish versions of a school-to-home connection letter describing activities that go along with this lesson.


Take-Home Literacy Activities

Dear Family,

Families play an important role in their children's education.

Your child has been learning about designing space shuttles.

Have your child lead you in the fun activities below. You will see how much your child has learned, and you can help your child reinforce his or her learning.

- **Make Rockets:** With the help of a family member, visit **www.science-sparks.com/baking-soda-rocket**. Make two or three baking soda rockets. Decorate each one differently. Write a hypothesis about which rocket will perform best.
- **Fly Your Rockets:** Using the rockets from the first activity, launch the rockets with a family member. Write notes about each launch. Compare and contrast the rocket launches. Then, write a paragraph about your rocket launches. Was your hypothesis correct?

Sincerely,

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Speaking and Listening

1. Ask students whether they think there is life in another galaxy. Tell students to imagine that extraterrestrials have arrived on Earth from the Andromeda Galaxy. They will be the first humans to greet the visitors and tell them about our world.
2. Explain that they will take turns acting out this greeting, but with a specific purpose in mind. Write the following purposes on notecards, and read them aloud:

    to be friendly and make them feel welcome

    to frighten them away

    to impress them with our achievements

    to share as little information as possible

3. **Talk Time:** Have students work in pairs to prepare a few ideas about what to say in each scenario. Then, have students take turns being aliens and human greeters. Have each greeter talk to the aliens with one of the purposes above in mind. Encourage partners playing the part of the aliens to ask follow-up questions. Have students practice their conversations with each of the purposes.
4. Ask students which greetings were most effective and why. Discuss how people change what they say based on context.

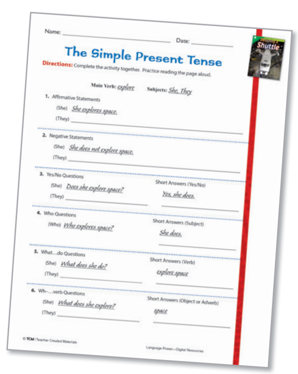
Language Development

1. Talk with students about simple verb tenses: past, present, and future. Explain that present tense verbs are single words that describe an action in the moment. Write a few examples for students to see: *I read*. *You eat*. *Carmen dances*. Ask students to identify examples of present tense verbs from their lives by telling what they do in their free time (e.g., *play video games*, *read*, *volunteer*). Ask students to review the text and identify which tense most of the text is written in (*simple present tense*).
2. Write the following question and answer for students to see:

    Where do you live?

    I live around the corner.

3. Read the example question and answer. Underline the present tense verb *live* in the answer. Ask students what questions they could ask that are answered in the text. Write a couple of student questions, and have students answer them using the simple present tense.
4. **Talk Time:** Have students work in pairs to continue asking and answering questions about the book, using the simple present tense.
5. To deepen students' understanding of the simple present tense, distribute *The Simple Present Tense* (provided in the Digital Resources). Guide students in completing the activity.


Name: ____ Date: ____

The Simple Present Tense

Directions: Complete the activity together. Practice reading the page aloud.

Main Verb: *explore* Subjects: *She, They*

1. Affirmative Statements
(She) *She explores space.*
(They) ____

2. Negative Statements
(She) *She does not explore space.*
(They) ____

3. Yes/No Questions
(She) *Does she explore space?*
(They) ____
Short Answers (Yes/No)
Yes, she does.

4. Who Questions
(Who) *Who explores space?*
Short Answers (Subject)
She does.

5. What...do Questions
(She) *What does she do?*
(They) ____
Short Answers (Verb)
explore space

6. Wh-...verb Questions
(She) *What does she explore?*
(They) ____
Short Answers (Object or Adverb)
space

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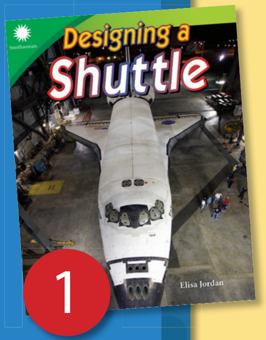
Language Power—Digital Resources



Name: ____________________ Date: ____________

Asking the Questions

Directions: Write questions about space shuttles or the book. After reading, have a partner answer your questions.

"Who" Question
____
____
____

"What" Question
____
____
____

"When" Question
____
____
____

"Where" Question
____
____
____

"Why" Question
____
____
____

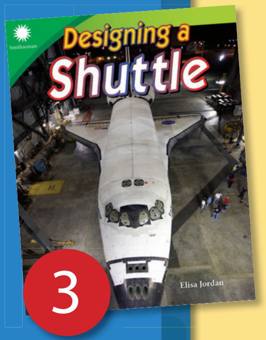
"How" Question
____
____
____

Name: ______________________________ Date: ______________

Solutions

Directions: Review the text to find how the space shuttle design solved each of the following problems. Record your answers in the Solution column.

Problem	Solution
1. The shuttle needs to get past Earth's stratosphere.	
2. The shuttle needs to withstand extreme heat.	
3. The shuttle needs to be flexible.	



Name: ______________________ Date: ______________

Accomplishments

Directions: Write details from the text that support the main idea.

Main Idea: Designing the space shuttle led to many discoveries and technologies.

Understanding Science

Developing Technology

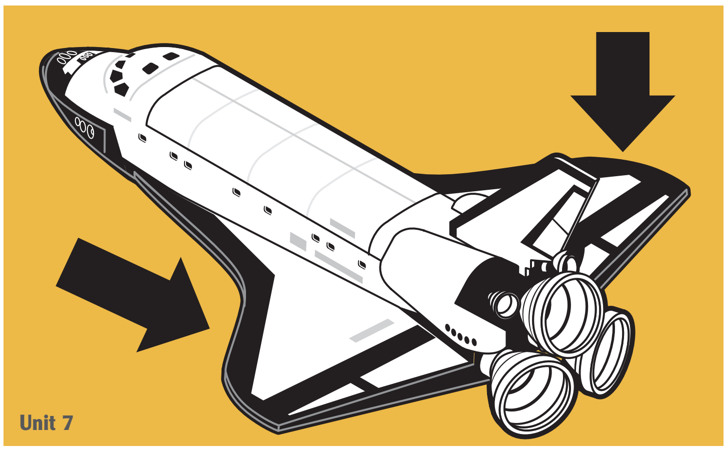
Working in Space

Name: ______________________ Date: ______________

Success?

Directions: There are many ways to evaluate success or failure. Consider your criteria for success. Then, write an argument about whether the space shuttle program was a success. Cite specific facts and evidence from the text to support your argument.

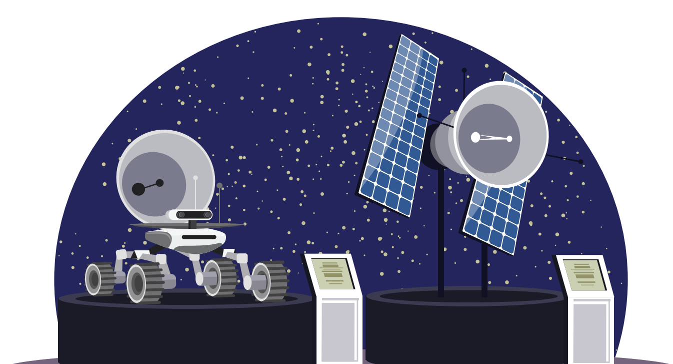
aluminum



delta wings

Unit 7

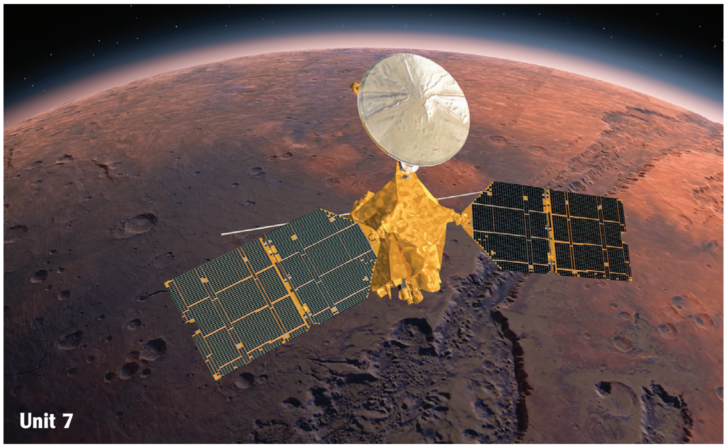
flexible



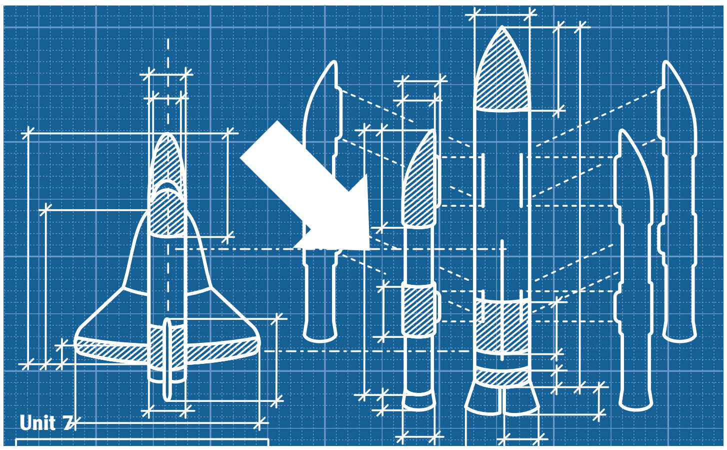
Unit 7

legacy

Unit 7: Designing a Shuttle



orbiter



solid rocket booster

thrust

withstand

Name: ______________________________ Date: ____________

The Simple Present Tense

Directions: Complete the activity together. Practice reading the page aloud.

Main Verb: *explore* **Subjects:** *She, They*

1. Affirmative Statements

(She) *She explores space.*

(They) ______________________________

2. Negative Statements

(She) *She does not explore space.*

(They) ______________________________

3. Yes/No Questions — Short Answers (Yes/No)

(She) *Does she explore space?* — *Yes, she does.*

(They) ______________________________ — ______________________________

4. Who Questions — Short Answers (Subject)

(Who) *Who explores space?* — *She does.*

____

5. What…do Questions — Short Answers (Verb)

(She) *What does she do?* — *explore space*

(They) ______________________________ — ______________________________

6. Wh–…verb Questions — Short Answers (Object or Adverb)

(She) *What does she explore?* — *space*

(They) ______________________________ — ______________________________

Dear Family,

Families play an important role in their children's education.

Your child has been learning about designing space shuttles.

Have your child lead you in the fun activities below. You will see how much your child has learned, and you can help your child reinforce his or her learning.

- **Make Rockets:** With the help of a family member, visit **www.science-sparks.com/baking-soda-rocket**. Make two or three baking soda rockets. Decorate each one differently. Write a hypothesis about which rocket will perform best.
- **Fly Your Rockets:** Using the rockets from the first activity, launch the rockets with a family member. Write notes about each launch. Compare and contrast the rocket launches. Then, write a paragraph about your rocket launches. Was your hypothesis correct?

Sincerely,

____

Actividades de lectoescritura para el hogar

Estimada familia:

La familia desempeña un papel importante en la educación de sus hijos.

Su hijo ha estado aprendiendo sobre diseñar transbordadores espaciales.

Pídale a su hijo que lo guíe para realizar las siguientes divertidas actividades. Verá cuánto ha aprendido y podrá ayudarlo a consolidar su aprendizaje.

- **Hacer cohetes:** Con ayuda de un familiar, visita **www.science-sparks.com/baking-soda-rocket/**. Haz dos o tres cohetes con bicarbonato de sodio. Decora cada uno de distintas maneras. Escribe una hipótesis sobre cuál de los cohetes funcionará mejor.
- **Hacer volar los cohetes:** Usando los cohetes de la primera actividad, lanza los cohetes con un familiar. Escribe notas sobre cada lanzamiento. Compara y contrasta los lanzamientos de los cohetes. Luego, escribe un párrafo sobre el lanzamiento de tus cohetes. ¿Era correcta tu hipótesis?

Atentamente,

____

Unit 7 Assessment: Space

Digital Assessments

Google™ version: **tcmpub.digital/lp/6-8c/unit7-g**

Microsoft® version: **tcmpub.digital/lp/6-8c/unit7-m**

Reflection

To activate student learning before completing the assessments, help students reflect on their learning. Hold up the books and cards, or point to any anchor charts or artifacts from the unit. Then, hold a group discussion using the following prompts:

- What was your favorite part of the unit?
- Talk to a partner about something new you learned about space.
- How do you think this unit helped you learn English?

Speaking and Listening

Read the directions, "Let's talk about this picture." Then, read each of the prompts to student(s), leaving time for responses.

	Question/Prompt	2 points	1 point	0 points
1	Apollo 11 was the first mission to the moon. Describe what you see in the picture.	Student gives a response related to the image. (*Example answer: A person is walking on the moon and carrying an American flag.*)	Student gives an incomplete response related to the image. (*Example answer: A person is walking.*)	Student's response is not relevant, not understandable, or communicates "I don't know."
2	Why is it challenging to get to the moon?	Student gives a response related to the image, using key vocabulary. (*Example answer: Astronauts must escape Earth's gravity, and the spacecraft must withstand a lot of heat and pressure.*)	Student gives an incomplete response related to the image. (*Example answer: The spacecraft must get to space.*)	Student's response is not relevant, not understandable, or communicates "I don't know."
3	What do you know about space exploration?	Student gives a response related to the image. (*Example answers: there is no gravity in space, space shuttles travel to space*)	Student gives an incomplete response related to the image. (*Example answer: People go to space.*)	Student's response is not relevant, not understandable, or communicates "I don't know."

Reading

Questions 1–2

1. The question is, "Which word describes the shape of the building's roof?" (*Answer: B. dome*)
2. The question is, "Which caption best matches this picture?" (*Answer: A. An early astronomer looks through a telescope.*)

Questions 3–4

3. The question is, "What does the author mean by the phrase *no big deal*?" (*Answer: C. Compared to other stars, our sun is just a regular star.*)
4. The question is, "Which detail could be added to the first paragraph?" (*Answer: D. Earth orbits the sun because of the sun's gravity.*)

Writing

	Question/Prompt	2 points	1 point	0 points
1	Write a sentence describing what you see in the picture.	Student writes a complete sentence about the picture using precise vocabulary. (*Example answer: I see an alien outside a spaceship on an imagined planet.*)	Student writes adequately about the picture but does not include both a subject and verb or does not use precise vocabulary.	Student's response is not relevant, not understandable, or communicates "I don't know."
2	Write a fictional narrative about finding a space alien. Use sensory words and details to make your story interesting.	Student writes a narrative paragraph and consistently uses grade-appropriate conventions. Student uses precise words and details.	Student writes three or four strong sentences. Student generally uses grade-appropriate conventions.	Student writes one or two sentences that are strong, or they write more but errors impede meaning.

Name: ______________________________ Date: ____________________

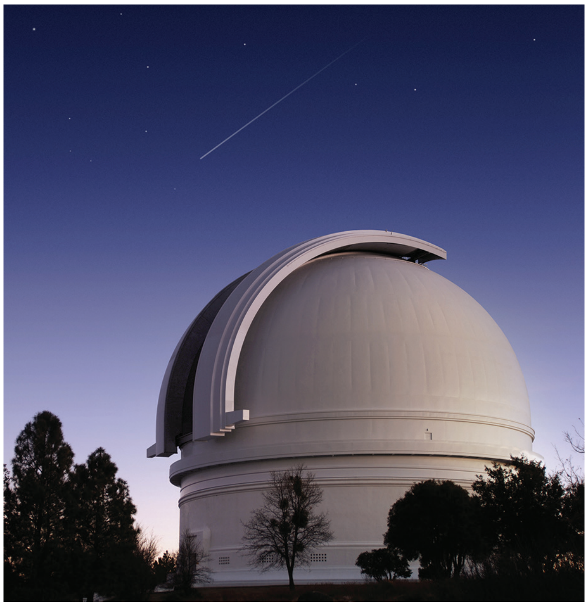
Speaking and Listening

Let's talk about this picture.

Name: ______________________________ Date: ________________

Reading

Look at the pictures. Then, answer the questions.



1. Which word describes the shape of the building's roof?

   Ⓐ tower
   Ⓑ dome
   Ⓒ cone
   Ⓓ rectangular prism

2. Which caption best matches this picture?

   Ⓐ An early astronomer looks through a telescope.
   Ⓑ A modern astronomer looks through a telescope.
   Ⓒ An early astronomer uses a satellite to observe stars.
   Ⓓ A modern astronomer uses a satellite to observe stars.

Name: ______________________________ Date: ____________________

Reading *(cont.)*

Read the text, and answer the questions.

Our solar system includes everything within the sun's gravity. Gravity is a force that pulls. Earth moves through space at super-fast speeds. But we stick to its surface. We don't fly away or fall off like you might think we would. That's because of gravity. Everything in our solar system is there because of the massive amount of gravity from our sun.

But can you believe that, compared to other stars, our sun is really **no big deal**? Stars are classified by size, temperature, and color. Our sun is about 5,500 degrees Celsius (10,000 degrees Fahrenheit) at the surface. That's hot, of course. But it's only average for a star. The distance around the sun is about 4.4 million km (2.7 million mi.). That's big! But then again, it's not big for a star.

3. What does the author mean by the phrase *no big deal*?

- (A) Compared to other stars, our sun is not important.
- (B) Compared to other stars, our sun is tiny.
- (C) Compared to other stars, our sun is just a regular star.
- (D) Compared to other stars, our sun is massive.

4. Which detail could be added to the first paragraph?

- (A) Jupiter is known as a gas giant.
- (B) Venus is the hottest planet in the solar system.
- (C) Comets are made of ice and dust.
- (D) Earth orbits the sun because of the sun's gravity.

Name: ______________________________ Date: ____________________

Writing

Look at the picture. Then, it's time to write!

1. Write a sentence describing what you see in the picture.

____

____

2. Write a fictional narrative about meeting a space alien. Use sensory words and details to make your story interesting.

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