Sample Pages from

Teacher Created Materials

Created *by* Teachers *for* Teachers and Students

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TIME for Kids Nonfiction Readers—Challenging

This sample includes the following:

TIME FOR KIDS

Nonfiction Readers

Challenging

Teacher's Guide

Teacher Created Materials

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Kit Components

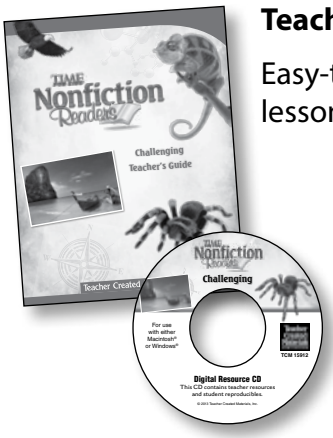
Trio 1

Trio 2

Trio 3

Trio 4

Trio 5

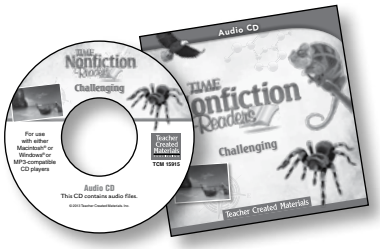


Teacher's Guide

Easy-to-use, standards-based lesson plans

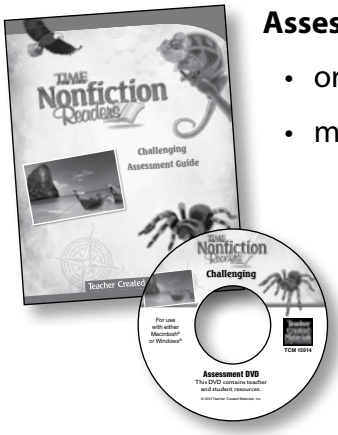
Digital Resource CD

- PDFs of books suitable for whiteboard use
- teacher resources
- student activity sheets



Audio CD

Professional recordings of books and poems

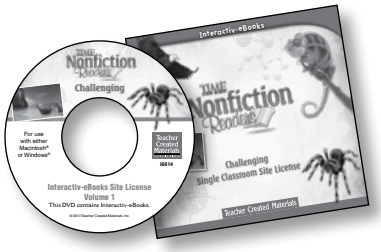


Assessment Guide

- oral reading records
- multiple-choice tests

Assessment DVD

- placement test
- assessments in both electronic and printable form

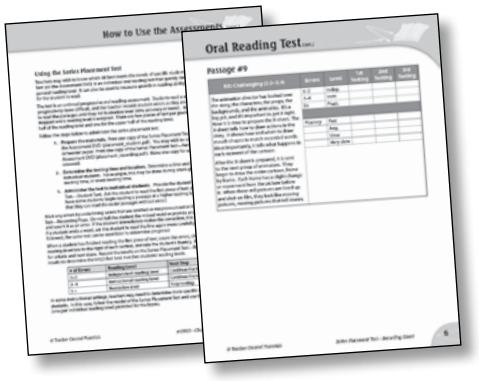


Interactiv-eBooks Single Classroom Site License

Interactiv-ebooks with embedded audio, videos, and activities

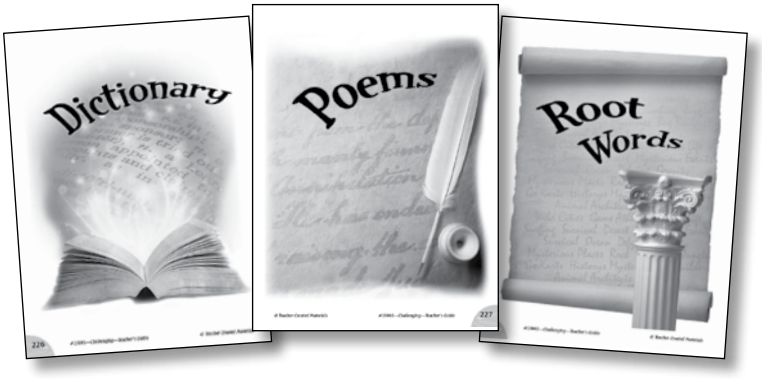
Getting Started

1. **Use the Series Placement Test.** Use the Series Placement Test (on the Assessment DVD) to determine which kit is most appropriate for students. For a complete overview of the placement test and directions for test administration, see page 7 of the Assessment Guide.



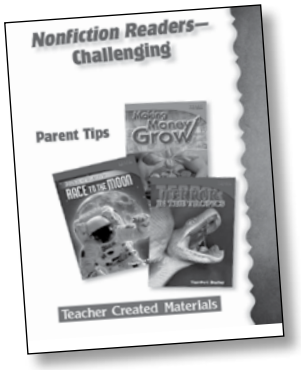
2. **Create reading groups.** If desired, place students in reading groups based on their reading levels or other instructional needs. See pages 29–30 for tips on using TIME For Kids *Nonfiction Readers* in a guided reading/ balanced literacy model.

3. **Prepare student resources.** As an option, create some student resources, including a personal dictionary and a poetry folder. These can be created with common classroom resources such as lined paper, construction paper, and spiral notebooks. See pages 226–228 (or the Digital Resource CD) for cover templates for these resources.



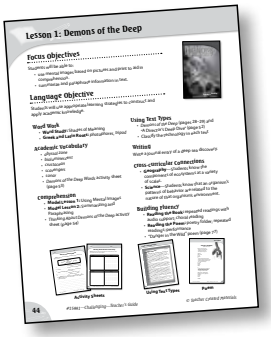
4. **Prepare assessment resources.** Depending on the amount of regular assessment planned, you may wish to create a simple assessment folder for each student. These folders can hold the student's placement test, oral reading records, multiple-choice tests, activity pages, and anecdotal records taken during the reading lessons.

5. **Make a home-school connection.** Send the Parent Tips booklet (found on the Digital Resource CD) home with students. The tips and activities in the booklet provide family members with the necessary tools to promote literacy development at home.

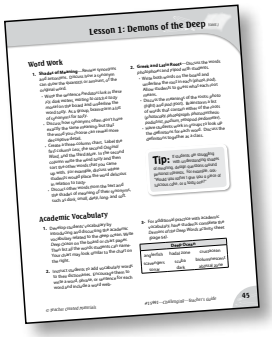


Teaching a Lesson

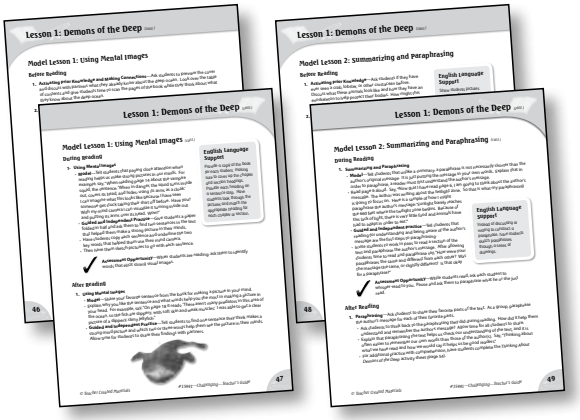
Each 11-page lesson is organized in a consistent format for ease of use. Teachers may choose to complete some or all of the lesson activities in order to best meet the needs of their students. The lesson begins with an overview page that provides key information for planning purposes.



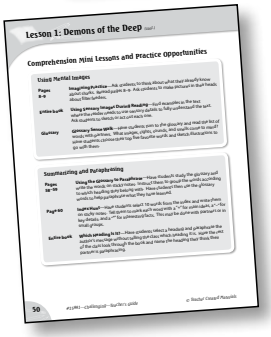
Lesson overview provides lesson objectives and key information for planning purposes.



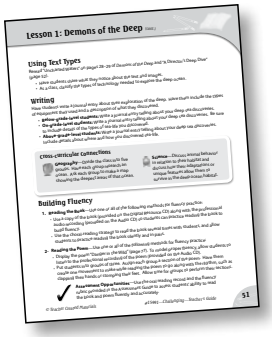
Word Work and Academic Vocabulary sections include activities and suggestions for teaching word patterns, parts of speech, Greek and Latin Roots, and key academic vocabulary.



Two Comprehension Model Lessons are carefully scaffolded and provide teacher modeling through think alouds as well as guided and independent practice opportunities for before, during, and after reading.

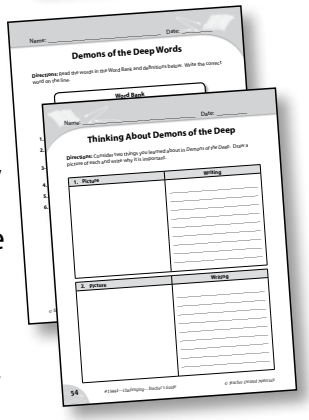


Comprehension Mini Lessons and Practice Opportunities provide teachers with simple and engaging activities that reinforce the comprehension skill addressed in the lesson.



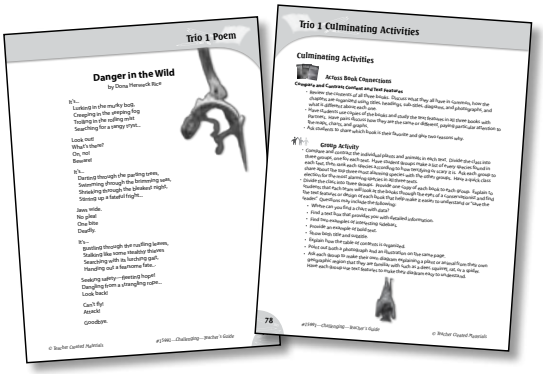
Using Text Types, Writing, Cross-curricular Connections, and Building Fluency sections offer additional activities for building comprehension and making connections.

Each lesson includes an **additional content-related text piece** (step-by-step instructions, primary sources, advertisements, magazine articles, etc.) to support comprehension. This text piece is used with the Using Text Type section of the lesson.



Student activity sheets can be used in a variety of ways to meet student's needs. They offer additional opportunities for practicing the skills addressed in the lesson.

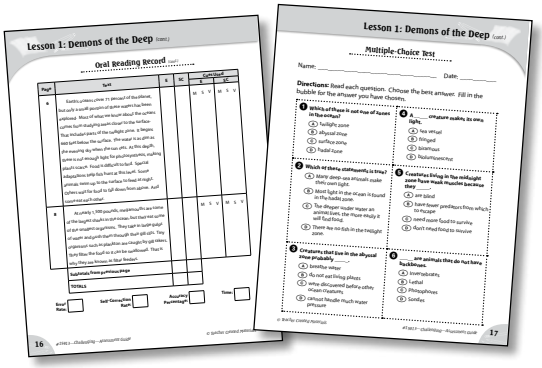
Using the Trio Resources



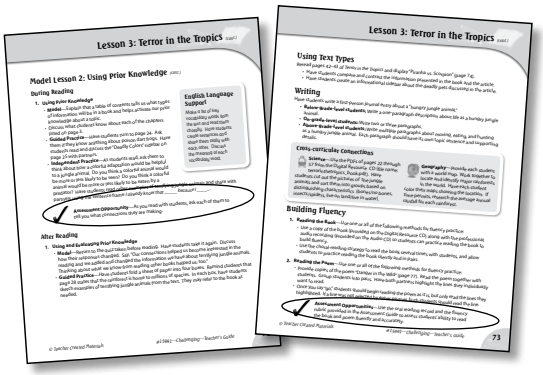
The fluency poem provided at the end of each trio provides a thematic connection to the book and can be used as a tool for building both content-area vocabulary and fluency. The Culminating Activities provide students with the opportunity to make across book connections and can be used as a tool for small-group interaction and for building comprehension.

Using Assessment Options

1. **Use formal assessments at the end of each lesson.** The oral reading record and multiple-choice comprehension test provided for each book offer opportunities to assess student learning and can be used to drive instruction. An overview of these assessments and the assessments themselves can be found in the Assessment Guide. The accompanying Assessment DVD offers two versions of the multiple-choice assessments: printable PDF form and electronic form, giving students the opportunity to take the test on the computer and print their results.



2. **Use informal assessments during each lesson.** Refer to the assessment tips embedded throughout the lessons to gather information about students' reading skills. Record anecdotal records as they meet the needs of your classroom.



Using Technology Options

1. **Use the Audio CD as a model of fluent reading.** The Audio CD includes professional recordings of the books and poems in this kit. Play the audio tracks of the books to support students as a prereading activity, during fluency practice, or in a listening center. Play the audio tracks of the poems as part of the poetry section of the lesson.

2. **Use the Interactiv-eBooks to enhance the reading experience.** This kit includes interactiv-ebooks that guide students toward independent reading and engage them in a fully interactive experience. Students can hear the text read aloud, view video clips, record their voices, and complete interactive activities that build academic skills—from word study and vocabulary to comprehension and writing. The interactiv-ebooks can be used in a variety of instructional settings and help support numerous literacy and learning goals. For a detailed overview of how to use the interactiv-ebooks in the classroom, see pages 40–41.

About the Books

TIME For Kids *Nonfiction Readers* is designed to enhance any reading program. Each book motivates students to *want* to read with high-interest content and engaging photographs. The authentic reading experiences help students develop vocabulary, comprehension, and fluency skills.

The books are grouped by reading levels. Challenging readers (levels 5.0 through 5.4) are designed for students in the first semester of grade five.

Level 5.0: *Demons of the Deep; Danger in the Desert; Terror in the Tropics*

Level 5.1: *20th Century: Race to the Moon; 21st Century: Mysteries of Deep Space; 22nd Century: Future of Space*

Level 5.2: *Bad Guys and Gals of the High Seas; Bad Guys and Gals of the Wild West; Bad Guys and Gals of the Ancient World*

Level 5.3: *All in a Day's Work: Police Officer; All in a Day's Work: ER Doctor; All in a Day's Work: Animator*

Level 5.4: *Making Money Grow; Where Does Your Money Go?; From Rags to Riches*

Leveling Components

Each reading level offers a variety of specialized features, including the following:

- detailed and descriptive text
- frequent use of sophisticated fonts in sidebars and chapter headings
- a Bibliography to keep students reading, a More to Explore section to extend and support the content, a glossary, an index, and a table of contents
- introduction of slanted body and sidebar text
- increased use of illustrations, graphics, and text features
- at least four interactive spreads to prompt critical thinking
- 64 pages for a robust reading experience and a reduced trim size of 5.25 x 8 inches

Special Features in the Books

Each reader includes the following special features to enhance the reading experience:

Think Link

- Introduces main concepts.
- Poses three critical thinking questions or key points to encourage reading with a purpose.

Dig Deeper!

- Provides background knowledge to access a deeper understanding.
- Offers a variety of text types, including instructions, maps, diagrams, and interviews.
- Provides high-interest graphics and interaction.

Stop! Think…

- Poses additional critical thinking questions.
- Guides students in expanding their visual literacy and comprehension, using information from charts, graphs, and more.

Word Counts and Level Correlations

Challenging Title	Word Count	TCM Level	Guided Reading Level	Early Intervention Level	DRA Level	Lexile® Measure
Demons of the Deep	1869	5.0	T	27	44	810L
Danger in the Desert	1900	5.0	T	27	44	770L
Terror in the Tropics	1844	5.0	T	27	44	810L
20th Century: Race to the Moon	1819	5.1	T	27	44	690L
21st Century: Mysteries of Deep Space	1780	5.1	T	27	44	730L
22nd Century: Future of Space	1882	5.1	T	27	44	760L
Bad Guys and Gals of the High Seas	1875	5.2	T	27	44	860L
Bad Guys and Gals of the Wild West	1873	5.2	T	27	44	900L
Bad Guys and Gals of the Ancient World	1790	5.2	T	27	44	730L
All in a Day's Work: Police Officer	1898	5.3	U	28	44	760L
All in a Day's Work: ER Doctor	1899	5.3	U	28	44	790L
All in a Day's Work: Animator	1810	5.3	U	28	44	810L
Making Money Grow	1890	5.4	U	28	44	760L
Where Does Your Money Go?	1749	5.4	U	28	44	860L
From Rags to Riches	1824	5.4	U	28	44	780L

Using TIME For Kids *Nonfiction Readers* in a Guided Reading/ Balanced Literacy Model

TIME For Kids *Nonfiction Readers* is a supplemental leveled reading program that can be flexibly implemented in a guided reading/ balanced literacy model. The high-interest books provide an engaging reading experience, while supporting the development of important reading skills including comprehension, fluency, vocabulary, and word work. The comprehensive Teacher's Guide with step-by-step, scaffolded model lessons and student activities can be easily incorporated into any block of a balanced literacy model including large group, guided reading groups, literature circles, or independent work time. Multiple assessment opportunities will diagnose students' needs and help direct teachers as they plan for differentiation and inform their instruction as they move students toward mastery of key reading and writing skills.

Guided Reading

Two key features of TIME For Kids *Nonfiction Readers* allow it to be effectively used within a guided reading program. First, it can serve to target specific word-work skills. Second, the high-interest, leveled books make them ideal selections for use with groups who need practice at certain reading levels and with general reading skills.

The TIME For Kids *Nonfiction Readers* are ideal to use with small teacher-led guided reading groups. The high-interest leveled books in this kit make them ideal selections to use with readers who read at levels 5.0–5.4. Oral reading records for each book are included in the Assessment Guide (and in digital format on the Assessment DVD) so that teachers can monitor the progress of students as they increase their reading level. The chart on page 28 indicates the reading levels of the books included within this kit.

The easy-to-follow lesson plan offers a carefully scaffolded format that provides explicit teacher modeling through think alouds as well as guided practice to use with peers and independently (Oczkus 2009). Teachers may use the TIME For Kids *Nonfiction Readers* in a variety of small group settings including guided reading groups and as an intervention with struggling readers.

Additionally, the strong word work and rich language support make TIME For Kids *Nonfiction Readers* an excellent program to use with English Language Learners.

Lesson Plan Structure

The core of the guided reading lesson is organized around Before, During, and After Reading activities and suggestions. Each book targets two main strategies or skills (refer to page 229 for a complete list of the skills addressed in this kit). Each comprehension strategy lesson is carefully scaffolded using teacher modeling, guided practice, and independent practice. The lessons are designed to provide a rich menu for teachers to pick and choose from as they differentiate instruction for students. If needed, the lessons can also be used as a quick review or mini-lesson.

Targeting Leveled Practice and Other Reading Skills

Each book included in the TIME For Kids *Nonfiction Readers* program has been leveled for use in small groups of students with similar reading levels. In addition to teaching the specific comprehension skills students need to read nonfiction, the lesson plans for the TIME For Kids *Nonfiction Readers* also include carefully crafted instruction in the following areas of literacy:

Word Work: Students study word patterns, parts of speech, and Greek and Latin roots.

Guided Reading *(cont.)*

Academic Vocabulary: Students study key academic vocabulary through the use of dictionaries, graphic organizers, drama, sketching, and glossary use. Many of the activities are appropriate for whole-class work in a vocabulary session focusing on activities suggested in the lesson plans for vocabulary development or for word-knowledge practice.

Fluency: Fluency lessons are based on reading the book, a poem, or other content-related text.

Writing: The lesson plan for each book includes a writing activity. Additionally, writing is integrated into the activity sheets. Depending on the level of the TIME For Kids *Nonfiction Readers* kit a teacher is using in the classroom, the writing activities vary from requiring students to write sentences to writing short stories as a way to apply the new skills they learn, or as a way to show comprehension of the story.

In addition to nonfiction reading skill development, as students move through the books in the program they will encounter carefully written content designed to provide practice with many other areas of literacy, such as word knowledge and increasingly complex sentence structures and text features.

Progress Monitoring

Assessment options are found directly in the lesson so that teachers can keep ongoing formative assessment records and adjust instruction accordingly. Oral reading records and comprehension checks are included to help provide further opportunities to monitor student progress. During the lessons, frequent assessment checks and suggestions for observing students while reading offer concrete ways to inform instruction and chart student progress in the program. The activity sheets that accompany each lesson also provide assessment checks for the teacher. The informal and formal assessments are in easy-to-use formats.

Other Blocks of a Balanced Reading Program

Learning Centers and Independent Practice

One of the challenges of a guided reading program is making sure the students who are not in the small instructional group with which the teacher is currently working are constructively engaged. TIME For Kids *Nonfiction Readers* lesson plans provide ample suggestions and materials for independent student use and for the development of centers. For example, two high-interest activity sheets are included for each book. Students may complete these practice pages independently after reading the book.

Independent Reading

Students who spend more time reading independently outperform their peers on standardized tests and other measures. Time spent reading independently is the best predictor of reading achievement (Anderson, Wilson, & Fielding 1988). The books from the TIME For Kids *Nonfiction Readers* series provide easy-to-read and high-interest content. They can be added to classroom libraries for independent reading selections.

Using Text Types

Intertextuality is the way that one text might draw on or resemble the characteristics of another, causing the reader of the texts to make links between them (Anstey and Bull 2006). Students need to be able to integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. They also need to be able to analyze how two or more texts address similar themes or topics to build knowledge or to compare the approaches the authors take (National Governors Association Center for Best Practices and Council of Chief State School Officers 2010). Each book in this kit has an additional content-related text selection to support this key skill.

Lesson 4: 20th Century: Race to the Moon

Focus Objectives

Students will be able to:

- establish a purpose for reading.
- make, confirm, and revise simple predictions about a text.

Language Objective

Students will use learning strategies to extend communicative competence.

Word Work

- **Word Study:** Homophones
- *Homophones* activity sheet (page 88)
- **Greek and Latin Roots:** *television*, *astronaut*

Academic Vocabulary

- *astronauts*
- *lunar*
- *space shuttle*
- *earthrise*
- *space race*

Comprehension

- **Model Lesson 1:** Establishing a Purpose
- *Establishing a Purpose* activity sheet (page 89)
- **Model Lesson 2:** Making Predictions

Using Text Types

- *20th Century: Race to the Moon* and "Apollo" (page 87)
- Create a flow chart

Writing

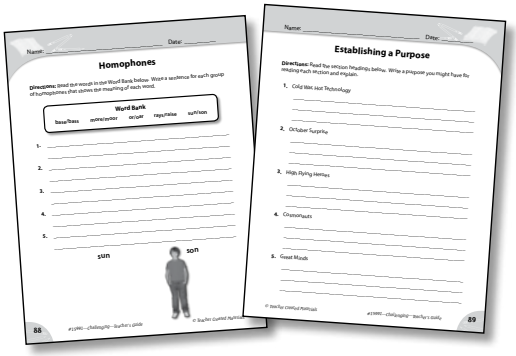
Create a persuasive piece about the significance of space travel, explaining why it is (or isn't) important.

Cross-curricular Connections

- **Working With Others:** Students know the behaviors and skills that contribute to team effectiveness.
- **World History:** Students understand major shifts in world geopolitics between 1900 and 1945, and understand the growing role of the United States in international affairs.

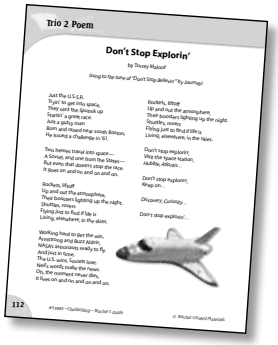
Building Fluency

- **Reading the Book:** repeated readings with audio support; choral reading
- **Reading the Poem:** poetry folder; repeated readings; performance
- "Don't Stop Explorin'" poem (page 112)



Activity Sheets

Using Text Types



Poem

Word Work

1. **Homophones**—Discuss how some words sound the same but have different meanings and spellings such as *maid* and *made*. Remind students that these words are called homonyms or homophones.
   - Create a homophone list beginning with the examples *feet* and *feat*. After adding each word to the list, discuss its meaning. Ask students to create a sentence using both words such as, "*It was a great feat to have human feet*."
   - Explain that *20th Century: Race to the Moon* contains many words that can be added to the homophone list. Ask students to turn to pages 28–29. Ask them to reread the page sidebars for homophones. If necessary, help students identify *more*. Point out that it is a homophone for *moor*. Discuss the meanings of the two words.
   - Repeat with other words from the text: *or* (oar, and ore), *base* (bass), *sun* (son).
   - For additional practice with homophones, have students complete the *Homophones* activity sheet (page 88).
2. **Greek and Latin Roots**—Discuss the words *television* and *astronaut* with students.
   - Write both words on the board and underline the root in each (*vis*, *astro*). Allow students to guess what each root means.
   - Discuss the meanings of the roots: *vis* (see) and *astro* (star).
   - Have students brainstorm other words that contain each root. (*vision*, *invisible, visual*, *audiovisual, advisor, astronomy, astrology, astral*).

Tip: Have students continue to look for homophone sets in *20th Century: Race to the Moon* and other texts to add to their lists.

Academic Vocabulary

1. Develop students' vocabulary by looking at the pair of vocabulary words: *lunar* and *space shuttle*. Have them use an encyclopedia or the Internet to find the images and descriptions for each.
2. Have students work in small groups to create booklets that illustrate these two words. As time permits, repeat this process for the remaining academic vocabulary words listed on page 79.
3. Instruct students to add high-frequency and vocabulary words to their dictionaries. Encourage them to write a word, phrase, or sentence for each word and include a word web.

Model Lesson 1: Establishing a Purpose

Before Reading

1. **Establishing a Purpose**—Have students share reasons why they read nonfiction texts.
   - Explain that good readers often select nonfiction topics that they find interesting. Tell students that today they will choose what they want to learn about in *20th Century: Race to the Moon.*
   - Review the table of contents, major headings, and illustrations.
   - Read pages 4–5 together. What do students already know about the space race? Use the table of contents to discuss how the book is organized. Which chapter looks most interesting? Why?
   - **Model**—Tell students that good readers often read to answer the questions they have about a topic they are interested in.
   - Have students page through the book again and select one page or topic that he or she is most interested in. List the topics students choose on the board.
   - Tell students that they will be in charge of teaching their topic to the rest of the group after reading. Model by selecting your own topic and brainstorming the questions you have about it. Say, "I want to learn about the dangers astronauts face. I want to know why astronauts want to go into space despite the dangers. I know that they like the thrill and unique experience, but what else could there be?"
   - Model how to glance over illustrations and text to determine what you want to learn. Say, "Here is one question I have about the space race: I wonder how they determined it was safe for humans in space?"
   - **Guided Practice**—Encourage students to help you brainstorm two more possible questions about space travel to the moon before reading. Add their questions to the chart. Possible questions may include the following: *How many people have been to the moon? How long does the trip take? What skills does an astronaut need?*
   - Tell students you will read the page carefully to answer these questions and any other questions that pop up in your head during reading.
   - **Independent Practice**—Ask students to preview their selected pages to study the illustrations and to skim the text.
   - Have students ask at least three questions about their topic. Instruct them to write their questions on sticky notes or in their reading notebooks. They will return to their questions after reading to see if they've answered them.
   - For additional practice with comprehension, have students complete the *Establishing a Purpose* activity sheet (page 89).

English Language Support

Have students work in groups of three to create a questions poster. Have them write one chapter heading in the middle of the poster. Then have them draw or list questions surrounding the chapter heading. Have each group share their poster with the class.

Model Lesson 1: Establishing a Purpose *(cont.)*

During Reading

1. **Establishing a Purpose**
   - **Model**—Tell students that good readers look for answers to their questions as they read.
   - Read the paragraph on page 4 aloud. Then say, "I wanted to know how scientists knew it was safe for humans to travel in space. This part tells me about how much work it was. I read here that they struggled, failed, and learned. I wonder how they learned from their mistakes."
   - **Guided Practice**—Ask students to help you answer the rest of your questions as you read aloud.
   - Students should be prepared to explain their answers with evidence from the text—explicit or inferred.
   - **Independent Practice**—Have students refer to the three questions they asked before reading. Encourage them to read slowly and carefully to find answers.

English Language Support

Have students write two true statements and one false statement about the text. Ask the group to vote on which statements are true and which are false. Ask students how they could change the false statement to make it true.

Assessment Opportunity—Have students share one of their questions and answers with you. Do students know how to find answers in the text and infer using clues?

After Reading

1. **Summarizing and Responding**—Ask students to summarize what they have learned so far from reading their selected pages with partners. Have students share at least one example of a question they asked before reading that was answered as they read.

2. **Establishing a Purpose**
   - **Model**—Explain that readers are often asked to share what they have read with others. Say, "Before I teach you about my favorite page, I need to reread it very carefully so I can remember the important points and interesting details."
   - Read the page aloud, pausing to note the ideas you want to remember. Then say, "The 20th century was a time of great learning and advances in science. Scientists learned from both their successes and failures. Ultimately, putting a man on the moon was achieved."
   - **Guided and Independent Practice**—Have students reread their pages carefully to prepare their oral presentation. Have them present in pairs to the class.
     Note: You may wish to make this a research opportunity. Students may use the websites provided on pages 62 and 63 to do further research and add visuals.

Model Lesson 2: Making Predictions

Before Reading

1. **Activating Prior Knowledge**—Have students review the chapter, "To the Moon" What information was new? What did they know before? Ask students to spend a few moments paging through the rest of the "To the Moon" chapter and the next chapter, "What's Next?" Briefly discuss what they already know about the topics presented. Ask students to do a quick sketch of the topic they think they already know the most about before reading. Discuss and share with partners or the group.

2. **Making Predictions**
   - **Model**—Have students share what they already know about making predictions. Explain that when readers predict in nonfiction text, they use the chapter titles, photographs and illustrations, sidebars, and other text features to help them decide what the text might be about.
   - Explain that by predicting, you create interest in what you are about to read. While paging through the rest of the "To the Moon" chapter on pages 30–45, tell students "First it is helpful to make overall predictions for each chapter. For the rest of the 'To the Moon' chapter, I think I will learn how each section relates to the title 'To the Moon'. I see the author is going to teach us more details about each important part. I will find out why each are important. I can't wait to learn about the first moon walk. When I read, it is helpful to think about my predictions for the entire chapter."
   - **Guided and Independent Practice**—Have students make chapter prediction(s) for "What's Next?" with partners.
   - Guide each pair as they study the headings "The Age of Satellites," "Space Shuttles," "Space Stations," and "Spectacular Stations." Ask them to think why these titles are placed together in a chapter called, "What's Next?" Use the sentence frame *I think this chapter is about* _____ *because* _____. Have each pair share predictions for the chapter. Record students' predictions on a chart.

English Language Support

Pair students and have them ask each other *what*, *where*, and *why* questions based on the "Earthrise, The Picture" sidebar on page 33.

Model Lesson 2: Making Predictions *(cont.)*

During Reading

1. **Making Predictions**
   - **Model**—Remind students that good readers make predictions when reading. Say, "Today we will learn a technique called Read a Little, Predict a Little. I'm looking at the pictures, headings, chart, and highlighted words on pages 46–57. I think I will learn about satellites in 'Age of Satellites'. I think the next part on page 48 is about advances in the space shuttle because of the title 'Space Shuttle' and the large picture of a space shuttle".
   - **Guided Practice**—Have partners practice Read a Little, Predict a Little with the "Space Stations" title using the sentence frame *I think this is about _____ because _____*. After reading the title, ask students if they learned anything extra.
   - **Independent Practice**—Have students practice Read a Little, Predict a Little, stopping before each caption or heading to make a prediction for that section.

English Language Support

Have students create a poster with headings and pictures that represent their top five facts. You may wish to bring in science or space magazines for them to cut out pictures or have them draw them. Allow students to share their posters with the class.

Assessment Opportunity—Have individuals predict what they will learn or what the text is about using small portions of text. What did they use to make their predictions?

After Reading

1. **Summarizing and Responding**—Assign pairs to give a quick oral summary of one of the chapters using headings and illustrations. What are some of the important advances in the space program? Why is each significant?

2. **Making Predictions**
   - **Model**—Explain that good readers think about their predictions during reading, changing or adding to them as they read more.
   - Review the list of predictions students made for the last chapters of the book. Say, "I predicted that we would learn about different parts of the space program and how scientists learned from their successes and failures. I changed my prediction as I was reading because I noticed that they also talked about the future of the space program. Because I wasn't expecting this, I paid closer attention. I didn't realize how much is still left to do and learn."
   - Explain that returning to our original predictions helps us to remember what we have read.
   - **Guided and Independent Practice**—Ask students to revisit one of their predictions from the chart for the chapter "What's Next?" Were their predictions on target, or did they need to be changed during reading? Did students learn what they thought they would? If not, what questions do they still have?

Comprehension Mini Lessons and Practice Opportunities

Establishing a Purpose

Any chapter	**Reading to Answer Questions**—Model how to look at each page within a chapter and how to ask questions in your head. Demonstrate how to use the sidebars, key vocabulary, and photographs to prompt questions before you read. Have partners share one question they asked and then found an answer to.
Entire book	**Reading to Choose a Topic**—Allow students to select something from the book they are interested in learning more about. Invite students to read more about their topics using the websites suggested on page 63 or by using the Internet. Before they begin reading, have students think of at least three questions they have about their selected topic. Were their questions answered after reading?
Entire book	**Mini Presentations**—Have students select one thing from the book to report about. They will create a big book of facts about space travel in the 20th century. Guide students as they decide what information is most important to share and illustrate.

Making Predictions

Any chapter	**Read a Little, Predict a Little**—Invite students to read through another chapter, using Read a Little, Predict a Little. Partners read headings and small portions of text, then pause and predict for the next portion before reading on. Discuss how predicting helps a reader.
Pages 18, 38–39, 22–23	**Predicting with Different Types of Pages**—Ask students to pay attention to how they make predictions on different types of pages in the text. Turn to pages 38–39. Students make predictions about the overall page and then each caption. Discuss how predicting with a page of captions is different than making predictions with a full page of text, such as page 18. (Possible responses: *When predicting with a page full of captions, you need to know what they all have in common and what the author is trying to accomplish; you use the bold words and pictures more.*) How do you predict with a page that has a flow chart like pages 22–23?
Glossary	**Predicting with the Glossary**—Before reading the book, invite students to preview the chapters using the headings, illustrations, and bold words. Review the table of contents and the chapter titles. Turn to the glossary. As students read through the words, have them predict which chapter the word will be in. (For example: I think the word *USSR* will be in the "Space Race" chapter.) Students turn to the chapter to see if their prediction is correct.

Using Text Types

Review the various flow charts in the book *20th Century: Race to the Moon*. Discuss the purposes and features of each. Read "Apollo" (page 87).

- Have students create a flow chart for the moon landing. Ask students to choose and defend the type of flow chart they will create. Why is it a good way to relay the information?
- Allow students to share their flow charts with the class.

Writing

Have students think about the significance of space travel. Is it important or not? Have students write a persuasive piece explaining their opinion using academic vocabulary and persuasion.

- **Below-grade-level students:** Write a simple paragraph with a stance and 2–3 reasons.
- **On-grade-level students:** Write a persuasive paragraph including a detailed stance on the significance of space travel and 3–4 reasons from the text to support it.
- **Above-grade-level students:** Write a detailed persuasive paragraph about the importance of space travel with support from the text and other research from the Internet or library.

Cross-curricular Connections

Working with Others—Discuss the benefits and challenges in a multi-country space station and the importance and challenges of working with others regardless of nationality.

World History—As a class, make a flow chart of the space race and how the scientific breakthroughs both advanced the space race and lead to further competition.

Building Fluency

1. **Reading the Book**—Use one or all of the following methods for fluency practice:
   - Use a copy of the book (provided on the Digital Resource CD) along with the professional audio recording (provided on the Audio CD) so students can practice and build fluency.
   - Use the choral-reading strategy to read the book several times with students, and allow students to practice reading the book independently, or in pairs.
2. **Reading the Poem**—Use one or all of the following methods for fluency practice:
   - Provide copies of the poem "Don't Stop Explorin'" (page 112) for students. Chorally read the poem once through, so students can hear the rhythm.
   - Have student pairs rearrange the punctuation marks so the sentences are grouped differently, resulting in a different rhythm. Allow pairs to practice the new version of the poem.

Assessment Opportunities—Use the oral reading record and the fluency rubric provided in the Assessment Guide to assess students' ability to read the book and poem fluently and accurately.

Apollo

Humankind's first steps on the lunar surface

July 20, 1969: One Giant Leap For Mankind

July 1969. It's a little over eight years since the flights of Gagarin and Shepard, followed quickly by President Kennedy's challenge to put a man on the moon before the decade is out.

It is only seven months since NASA's made a bold decision to send Apollo 8 all the way to the moon on the first manned flight of the massive Saturn V rocket.

Now, on the morning of July 16, Apollo 11 astronauts Neil Armstrong, Buzz Aldrin and Michael Collins sit atop another Saturn V at Launch Complex 39A at the Kennedy Space Center. The three-stage 363-foot rocket will use its 7.5 million pounds of thrust to propel them into space and into history.

At 9:32 a.m. EDT, the engines fire and Apollo 11 clears the tower. About 12 minutes later, the crew is in Earth orbit.

After one and a half orbits, Apollo 11 gets a "go" for what mission controllers call "Translunar Injection"—in other words, it's time to head for the moon. Three days later the crew is in lunar orbit. A day after that, Armstrong and Aldrin climb into the lunar module Eagle and begin the descent, while Collins orbits in the command module Columbia.

Collins later writes that Eagle is "the weirdest looking contraption I have ever seen in the sky," but it will prove its worth.

When it comes time to set Eagle down in the Sea of Tranquility, Armstrong improvises, manually piloting the ship past an area littered with boulders. During the final seconds of descent, Eagle's computer is sounding alarms.

It turns out to be a simple case of the computer trying to do too many things at once, but as Aldrin will later point out, "unfortunately it came up when we did not want to be trying to solve these particular problems."

When the lunar module lands at 4:18 p.m EDT, only 30 seconds of fuel remain. Armstrong radios "Houston, Tranquility Base here. The Eagle has landed." Mission control erupts in celebration as the tension breaks, and a controller tells the crew "You got a bunch of guys about to turn blue, we're breathing again."

Armstrong will later confirm that landing was his biggest concern, saying "the unknowns were rampant," and "there were just a thousand things to worry about."

At 10:56 p.m. EDT Armstrong is ready to plant the first human foot on another world. With more than half a billion people watching on television, he climbs down the ladder and proclaims: "That's one small step for a man, one giant leap for mankind."

Aldrin joins him shortly, and offers a simple but powerful description of the lunar surface: "magnificent desolation." They explore the surface for two and a half hours, collecting samples and taking photographs.

They leave behind an American flag, a patch honoring the fallen Apollo 1 crew, and a plaque on one of Eagle's legs. It reads, "Here men from the planet Earth first set foot upon the moon. July 1969 A.D. We came in peace for all mankind."

Armstrong and Aldrin blast off and dock with Collins in Columbia. Collins later says that "for the first time," he "really felt that we were going to carry this thing off."

http://www.nasa.gov/mission_pages/apollo/apollo11_40th.html

Name: _____ Date: _____

Homophones

Directions: Read the words in the Word Bank below. Write a sentence for each group of homophones that shows the meaning of each word.

Word Bank

base/bass **more/moor** **or/oar** **rays/raise** **sun/son**

1. _____

_____

2. _____

_____

3. _____

_____

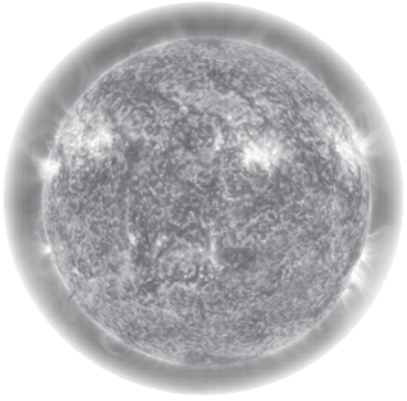
4. _____

_____

5. _____

_____

sun



son

Name: _____ Date: _____

Establishing a Purpose

Directions: Read the section headings below. Write a purpose you might have for reading each section and explain.

1. Cold War, Hot Technology

_____

_____

_____

2. October Surprise

_____

_____

_____

3. High Flying Heroes

_____

_____

_____

4. Cosmonauts

_____

_____

_____

5. Great Minds

_____

_____

_____

Oral Reading Record

Name:_____ **Date:** _____

Assessor: _____

Word Count	Codes				
277	E = errors	SC = self-corrections	M = meaning	S = structure	V = visual

Page	Text	E	SC	Cues Used	
				E	SC
4	Today, most people have cell phones. Satellite television is common. Every science textbook has pictures of Earth from outer space. But just 60 years ago, none of these things were possible. In the 1950s, we couldn't send objects beyond Earth's atmosphere. Then, we sent humans into space. We even landed astronauts on the moon. This was a time of discovery and great accomplishments. It was also a lot of work. Scientists from around the world gathered in the United States and the Soviet Union. They struggled, failed, and learned. Some made the ultimate sacrifice. They gave their lives to the cause. But in the end, what they achieved remains awesome!			M S V	M S V
	SUBTOTALS				

GO ON

Oral Reading Record *(cont.)*

Page	Text	E	SC	Cues Used	
				E	SC
6	During World War II, scientists made impressive rockets. The rockets were powerful enough to launch bombs into distant countries. But scientists wondered if they could be used for something else. Were they powerful enough to be fired into outer space? People have always been curious about what lies beyond Earth. At the end of the war, American and Soviet scientists began working toward this goal. But the two countries were enemies. And they didn't trust each other. This time period was called the Cold War. Instead of working together, each country began to compete. They both wanted to win the space race.			M S V	M S V
8	During the Cold War, the USSR and the United States built thousands of nuclear missiles. Each country wanted to have stronger weapons than the other. They thought this would keep them safe from attack. The same technology used to launch missiles also sends rockets into space. It was a dangerous time. But each missile that was launched taught us more about how to explore space.			M S V	M S V
	Subtotals from previous page				
	TOTALS				

Error Rate: ☐ **Self-Correction Rate:** ☐ **Accuracy Percentage:** ☐ **Time:** ☐

Multiple-Choice Test

Name: _____ Date: _____

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

1 **Which of these is *not* part of a space rocket?**

- (A) service module
- (B) launch escape system
- (C) lunar module
- (D) mission control

2 **The Cold War was mostly between the United States and _____.**

- (A) England
- (B) the USSR
- (C) China
- (D) India

3 **You can infer that during the Cold War, _____.**

- (A) the United States and the USSR did not share information
- (B) the United States and the USSR worked together on space projects
- (C) it was much safer to travel in space than it is now
- (D) scientists were not interested in going to the moon

4 **A _____ event is a terrible or disastrous thing.**

- (A) lunar surface
- (B) space race
- (C) catastrophic
- (D) command module

5 **Astronauts are probably good at _____.**

- (A) music
- (B) art
- (C) science
- (D) cooking

6 **If you have ever had an argument with someone and stopped speaking to them, that will help you understand _____.**

- (A) what the Cold War was like
- (B) how lunar modules work
- (C) what astronauts do
- (D) what a space shuttle is

Multiple-Choice Test *(cont.)*

Name: _____ Date: _____

7 **A pulse rate is an example of _____.**

(A) earthrise
(B) a space shuttle
(C) a lunar module
(D) a type of vital sign

8 **The Cold War caused the United States and the USSR to _____.**

(A) fight in World War II
(B) work together on the International Space Station
(C) compete to be the first into space
(D) name their space program Apollo

9 **Apollo 11 landed on the moon before _____.**

(A) Yuri Gagarin went into space
(B) the space shuttle was developed
(C) John Glenn orbited the Earth
(D) the Cold War started

10 **More than anything else, an astronaut needs to _____.**

(A) travel the world
(B) be able to do difficult calculations
(C) be a certain height and weight
(D) be able to stay calm in a crisis

11 **One very important thing to remember about the space race is that _____.**

(A) it started in 1957
(B) it pushed humans to explore space and land on the moon
(C) it involved hard work
(D) it included dogs named Strelka and Belka

12 **If the space race had not happened, what might we *not* have today?**

(A) satellites
(B) telescopes
(C) scientists
(D) airplanes

TIME FOR KIDS

20th Century

RACE TO THE MOON

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SPACE RACE

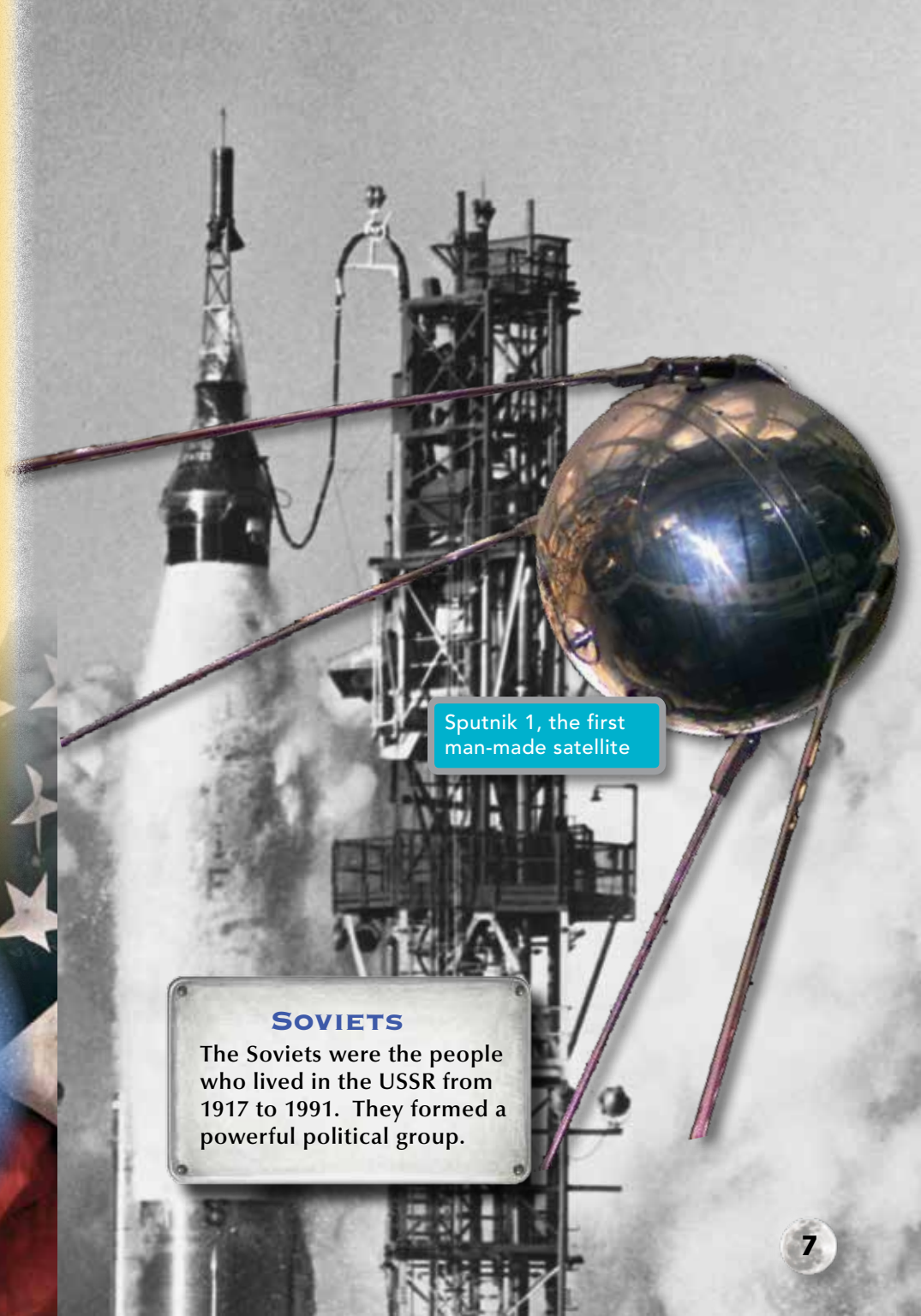
Today, most people have cell phones. **Satellite** television is common. Every science textbook has pictures of Earth from outer space. But just 60 years ago, none of these things were possible. In the 1950s, we couldn't send objects beyond Earth's atmosphere. Then, we sent humans into space. We even landed **astronauts** on the moon. This was a time of discovery and great accomplishments. It was also a lot of work. Scientists from around the world gathered in the United States and the **Soviet Union**. They struggled, failed, and learned. Some made the ultimate sacrifice. They gave their lives to the cause. But in the end, what they achieved remains awesome!

COLD WAR, HOT TECHNOLOGY

During World War II, scientists made impressive **rockets**. The rockets were powerful enough to launch bombs into distant countries. But scientists wondered if they could be used for something else. Were they powerful enough to be fired into outer space? People have always been curious about what lies beyond Earth. At the end of the war, American and Soviet scientists began working toward this goal. But the two countries were enemies. And they didn't trust each other. This time period was called the **Cold War**. Instead of working together, each country began to compete. They both wanted to win the space race.

The Race

The space race between the United States and the **Union of Soviet Socialist Republics (USSR)** lasted from 1957 until 1969.



Sputnik 1, the first man-made satellite

Soviets

The Soviets were the people who lived in the USSR from 1917 to 1991. They formed a powerful political group.

MISSILES

During the Cold War, the USSR and the United States built thousands of nuclear **missiles**. Each country wanted to have stronger weapons than the other. They thought this would keep them safe from attack. The same technology used to launch missiles also sends rockets into space. It was a dangerous time. But each missile that was launched taught us more about how to explore space.

ASTRO-SPIES

During the Cold War, both countries used their space programs to spy on each other. It was a dangerous game. If a spy was caught, it meant prison, or worse—death. Check out some of the secret missions developed for the astronauts and their eyes in the sky.

- Capture or destroy a satellite.
- Determine the number of weapons and planes on the ground.
- Practice for battles in space.
- Launch a spy station into orbit, equipped with a car-size camera.

"What makes the Soviet threat unique in history is its all-inclusiveness. Every human activity is pressed into service as a weapon of expansion. Trade, economic development, military power, arts, science, education, the whole world of ideas....The Soviets are, in short, waging total cold war."

—President Dwight D. Eisenhower, 1958

a missile test launch

OCTOBER SURPRISE

On October 4, 1957, Soviet scientists had the first major success in the space race. They launched Sputnik 1. This was Earth's first artificial satellite. It was the first non-natural thing to orbit the planet. The United States was caught off guard. It was working on its own satellite. But it wasn't ready. Soon, Soviet scientists had a string of impressive firsts. The competition was heating up. And the United States was falling behind.

Famous Firsts

First Dog in Space
Laika, November 3, 1957

First Man in Space
Yuri Gagarin, April 12, 1961

First American Satellite
Explorer 1, January 31, 1958

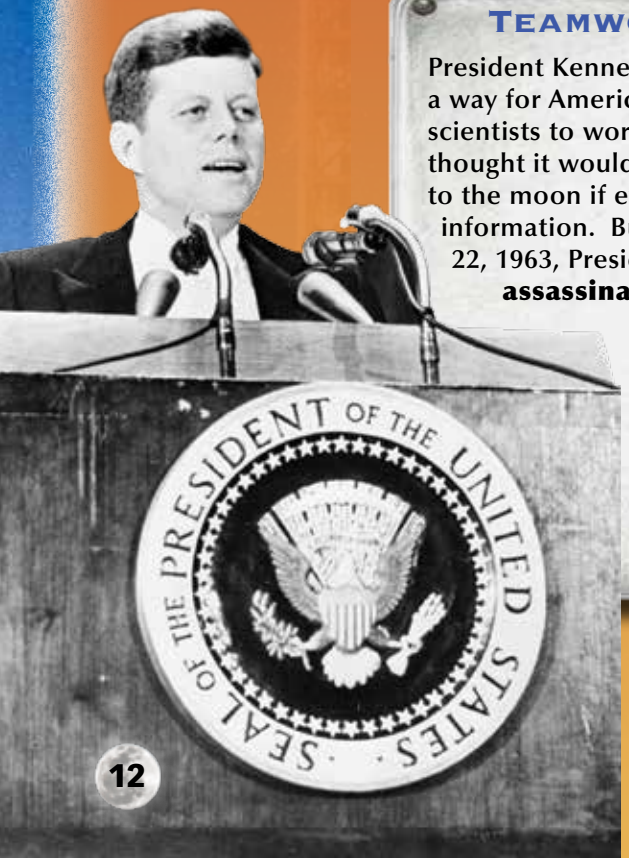
First Woman in Space
Valentina Tereshkova, June 16, 1963

First Space Walk
Alexei Leonov, March 18, 1965

96 Minutes
That's the amount of time it took Sputnik 1 to orbit Earth one time.

THE KENNEDY CHALLENGE

"I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth." In 1961, President John F. Kennedy issued this challenge to Americans. He knew it would be hard. But he said, "No single space project will be more...impressive to mankind." Setting a goal can help people manage their time. It can motivate them. And it can make them push themselves harder. The Apollo program was designed to make Kennedy's idea real.



Teamwork Lost

President Kennedy wanted to find a way for American and Soviet scientists to work together. He thought it would be easier to get to the moon if everyone shared information. But on November 22, 1963, President Kennedy was **assassinated**. His dreams of the United States and the Soviet Union working together were put on hold for another 30 years.

By the time the Americans landed on the moon, the Apollo Program cost $24 billion.

What's in a Name?

The American space program was named after the ancient Greek god Apollo. He was believed to be the god of the sun, pulling it across the sky each day.


DIG DEEPER!
Kennedy Space Center
President Kennedy made getting into space a national priority. That's one reason the space center in Florida is named after him. Since 1968, the National Aeronautics and Space Administration (NASA) has launched most missions from the Kennedy Space Center. If you are nearby, you can take a tour of it. What would you want to see first?
Orbit Cafe
Rocket Garden
Tour the rocket garden to compare the first rockets that put NASA astronauts in space.
Shuttle Launch Simulation Facility
Strap in for a ride in the simulator to feel the sights, sounds, and thrust of being launched into space.
Astronaut Encounter
Meet a retired astronaut and find out firsthand what it's like to be in space.
Space Shop
Check out gear from past missions.

HIGH FLYING HEROES

Getting to space is not something one person can do alone. Thousands of people worked on the space programs. Some traveled into space. Others worked on Earth to design the shuttles. They looked for the safest way to explore the solar system. The USSR and the United States both needed engineers to design the space ships. And they needed pilots to fly them. In the United States, these space travelers were called *astronauts*. In the USSR, they were known as **cosmonauts**.

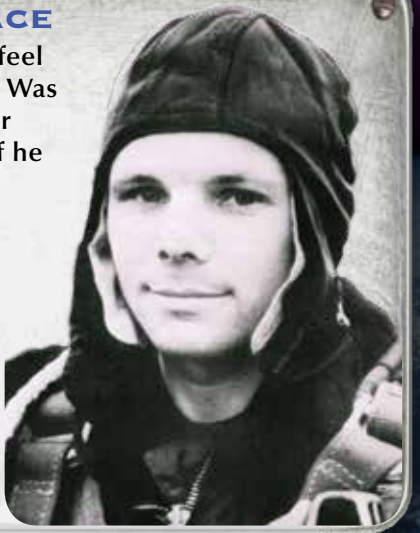
Dogs in Space

Laika may have been the bravest dog in the world—or the solar system. She was the first living creature to orbit Earth. The Soviets launched her in 1957. But she died during the trip. The first dogs to orbit Earth and return safely were Strelka and Belka. They were sent into space in 1960 and parachuted back.

First Human in Space

What did the first man in space feel 10 seconds before launch time? Was he terrified? No human had ever been in space. Did he wonder if he would die?

Yuri Gagarin was the first human in space. The Soviets successfully launched him into space in the *Vostok 1* capsule on April 12, 1961. After orbiting once, he was ejected from the craft and parachuted back to Earth. He spent 108 minutes in space.



Rats, monkeys, frogs, spiders, newts, and bees have all been sent into space!

COSMONAUTS

What does it take to be a cosmonaut? The first male cosmonauts were military pilots. Valentina Tereshkova was the first woman in space. Before that, she was a factory worker. But she had a taste for adventure. That is an important quality for those blasting into space. In the USSR, thousands of people applied to become the first person in space. Twenty were chosen for testing. They were tested physically and mentally. Above all, they needed to stay calm in stressful situations. Yuri Gagarin was chosen because he stayed calm through all the tests.

cosmonauts Gagarin and Tereshkova

Space Fashion

Astronauts wear suits that protect them from the extreme temperatures of space. The suits have life-support systems built in and protect against space dust.

Just In Case

Russia, formerly part of the USSR, is a large country with many wilderness areas. In these places there are wolves, bears, and other animals. Cosmonauts were each given a hunting knife to take with them—just in case the capsule landed somewhere with dangerous creatures!

THE RIGHT STUFF

In the United States, the first seven astronauts were military pilots. Before going into space, their job was to test new planes. They had to go through a lot of training and testing. No one was sure what space might be like. NASA wanted the astronauts to be ready for anything. The astronauts needed to be able to fly complicated machines. They had to be able to stay calm in a crisis. Astronauts were tested for physical fitness. They would be asked to follow difficult orders.

the original seven NASA astronauts

Astronaut Sunita Williams speaks with reporters during a press conference.

Hero Training

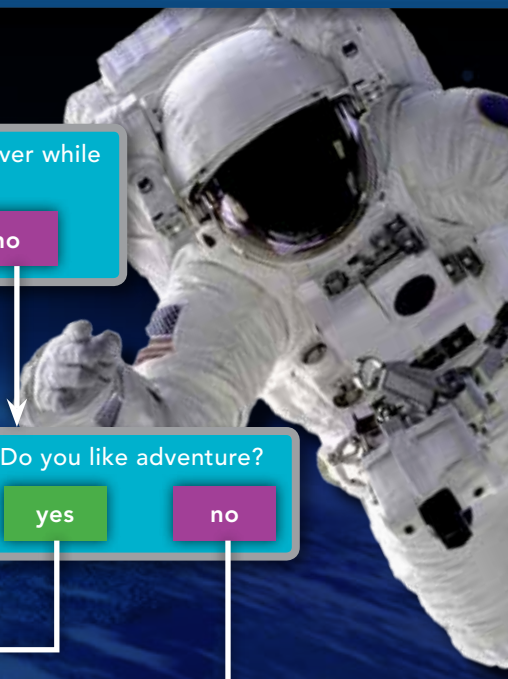
Astronauts don't just fly spacecrafts. They are national heroes. They must learn how to answer questions from reporters. The government does not want them to say anything that might make the space program look bad.

What Ever Happened To?

Many astronauts had impressive careers after they returned from space. John Glenn, the first American to orbit Earth, became a US senator. A dozen years after his 1969 flight to the moon, Alan Bean became an artist. Many astronauts stayed with the space program to teach new crews. Others became business leaders or teachers.

Do You Have What It Takes?

Less than 1,000 people have been chosen to be astronauts. Astronauts must have the right skills and personality for the job. Use this quiz to find out if you've got what it takes. Give yourself a point every time you answer *yes* to the questions below. If you score three or better, then you're on your way to becoming an astronaut! If not, don't worry! You have plenty of time to train.



Start here!

Do you enjoy learning new things?
yes no

Are you good with maps and directions?
yes no

Are you good at math and science?
yes no

Can you use a screwdriver while wearing gloves?
yes no

Do you like adventure?
yes no

Are you a strong swimmer?
yes no

If you answered *yes* to most questions, you've got the right skills to shoot for the stars.

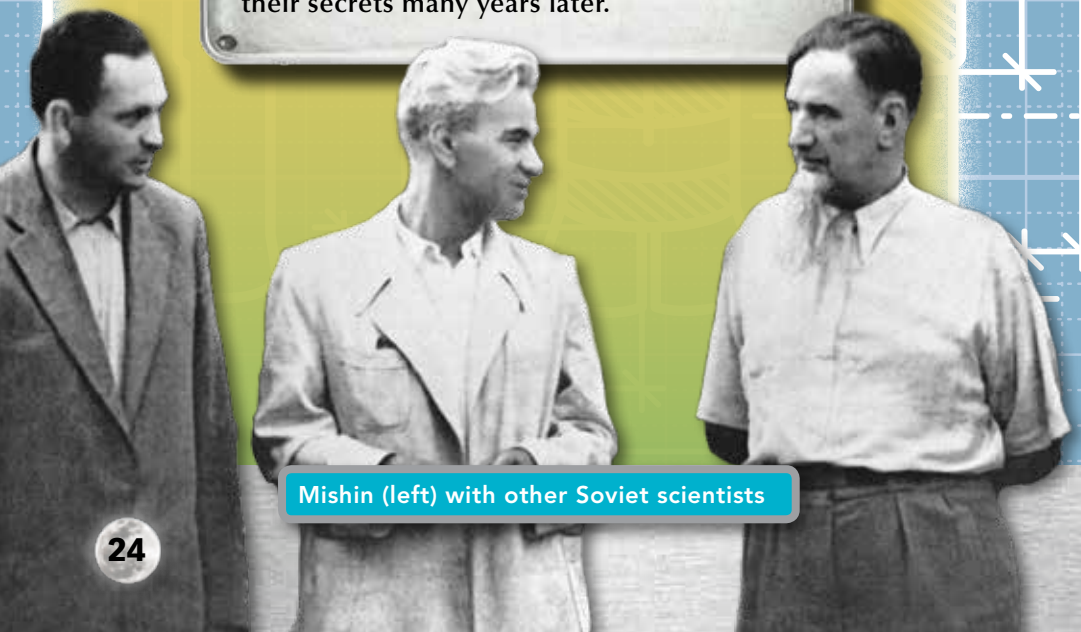
If you answered *no* to most questions, you may be happier (and safer) staying here on Earth.

GREAT MINDS

The space programs needed people with a variety of skills. Teams of engineers designed the spacecrafts. Wernher Von Braun led the team in the United States. He had designed rockets for Germany during World War II. But his real love was exploring space. He led the United States' space program until 1970. In the USSR, the chief designer was Sergei Koroloyov. He was a brilliant engineer. He worked with rockets from the 1930s until he died in 1966.

Mishin Diaries

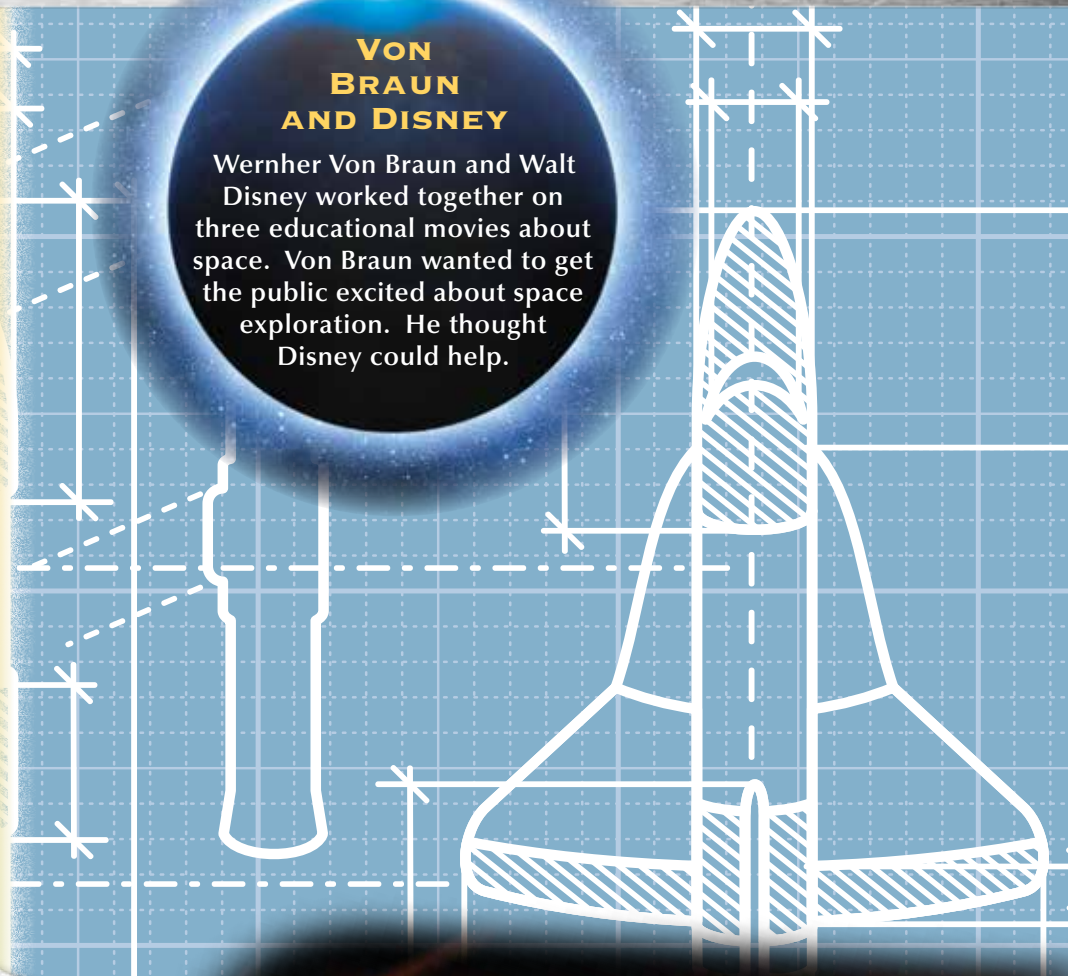
The Soviet space program was kept secret. But one man kept a diary that recorded his work. Vasily Mishin was one of Koroloyov's deputies. His diary provides insights about the people who worked on the project and lets us learn their secrets many years later.



Mishin (left) with other Soviet scientists

Von Braun and Disney

Wernher Von Braun and Walt Disney worked together on three educational movies about space. Von Braun wanted to get the public excited about space exploration. He thought Disney could help.



The USSR kept Sergei Koroloyov's identity a secret until his death.

DISASTERS

The early space programs were dangerous. The teams were pushing themselves. They wanted to be the first at something no one had tried before. Both countries had many setbacks and heart-wrenching losses. But they kept working toward their goals. The Soviets hoped their *N1 rocket* would take people to the moon. But on July 3, 1969, the rocket exploded on the launch pad. This was one of the largest explosions in history. It destroyed the launch pad. After this loss, the United States team was able to beat the Soviets to the moon.

March 23, 1961
Valentin Bondarenko was killed in a fire while training.

January 27, 1967
The Apollo 1 crew died when a fire swept through their space capsule. They were rehearsing launch procedures.

April 24, 1967
Vladimir Komarov was killed when the parachute on his space capsule didn't open on reentry into Earth's atmosphere.

March 27, 1968
Yuri Gagarin, the first man in space, was killed in a training crash.

June 29, 1971
The *Soyuz 11* crew died when a valve on their craft opened as they came back to Earth. All the oxygen escaped into space, and they suffocated.

Becoming an astronaut is dangerous. Why do you think so many people still apply for the job?

A DANGEROUS JOB

It is rare, but people still die on space missions. On January 28, 1986, the **space shuttle** *Challenger* exploded. All seven astronauts on board were killed. On February 1, 2003, there was another tragedy. The shuttle *Columbia* broke apart. Again, the entire crew was killed.

It is always a risk to fly into space, so why do people do it? Some astronauts complete the training to earn respect. Others want to learn about space. They want to help us find out what is out there. Each person has his or her own personal reasons. And each reason is in some way noble.

Moon Memories

On their visit to the moon, the Apollo 15 crew left a small memorial to astronauts and cosmonauts who had lost their lives.

Teacher in Space

Christa McAuliffe was one of the crew members on *Challenger*. She was going to be the first teacher in space. NASA chose her to get children and teachers more interested in space exploration.

Apollo 13

Apollo 13 was supposed to go to the moon. But it never made it. An oxygen tank exploded in space. "Houston, we've had a problem," astronaut John Swigert reported calmly. It was a disaster. But the astronauts worked with people back home. They stayed focused on fixing the problem, and the entire crew made it back safely. This is an example of why NASA looks for people who can work well in a crisis.

TO THE MOON

Setting foot on the moon changed the way humans see Earth. From the ground, our planet appears large. But from space, Earth looks like a big, blue marble. And marbles—even big ones—are not that big compared to everything else. Seeing Earth from far away had a strong effect on astronauts. Looking at Earth from space, they felt connected to the universe in a way they had never felt on Earth. They saw how small and precious our planet is. This understanding of Earth is called the **overview effect**. NASA psychologists used the phrase **space euphoria** (yoo-FAWR-ee-uh) to describe it.

a footprint left on the moon by an astronaut

"The Earth reminded us of a Christmas tree ornament hanging in the blackness of space. As we got farther and farther away it diminished in size. Finally it shrank to the size of a marble, the most beautiful marble you can imagine. That beautiful, warm, living object looked so fragile, so delicate, that if you touched it with a finger it would crumble and fall apart. Seeing this has to change a man...."

—James Irwin, astronaut

EARTHRISE

The astronauts on Apollo 8 were the first to orbit around the moon. Each had seen many sunrises on Earth. But in space, they saw something new. They saw an **earthrise**. An earthrise is when Earth becomes visible over the horizon of the moon.

Being There

Many of the planned space missions of the future will use robots instead of people. Why do you think robots are preferred over humans for future space travel? Do you think we lose something if humans don't make the trip?

a robonaut built to help humans explore space

Jim Lovell, William Anders, and Frank Borman of the Apollo 8 crew (left to right)

Earthrise, The Picture

Earthrise is the name of a famous photograph of Earth rising over the moon. The following conversation took place between astronauts Frank Borman and William Anders just before the picture was taken. Back then, there was no such thing as a digital camera. Cameras used rolls of film.

Borman: Look at that picture over there! Here's the Earth coming up. Wow, is that pretty.

Anders: Hey, don't take that, it's not scheduled.

Borman: (laughing) You got a color film, Jim?

Anders: Hand me that roll of color quick, will you...

THE EAGLE HAS LANDED

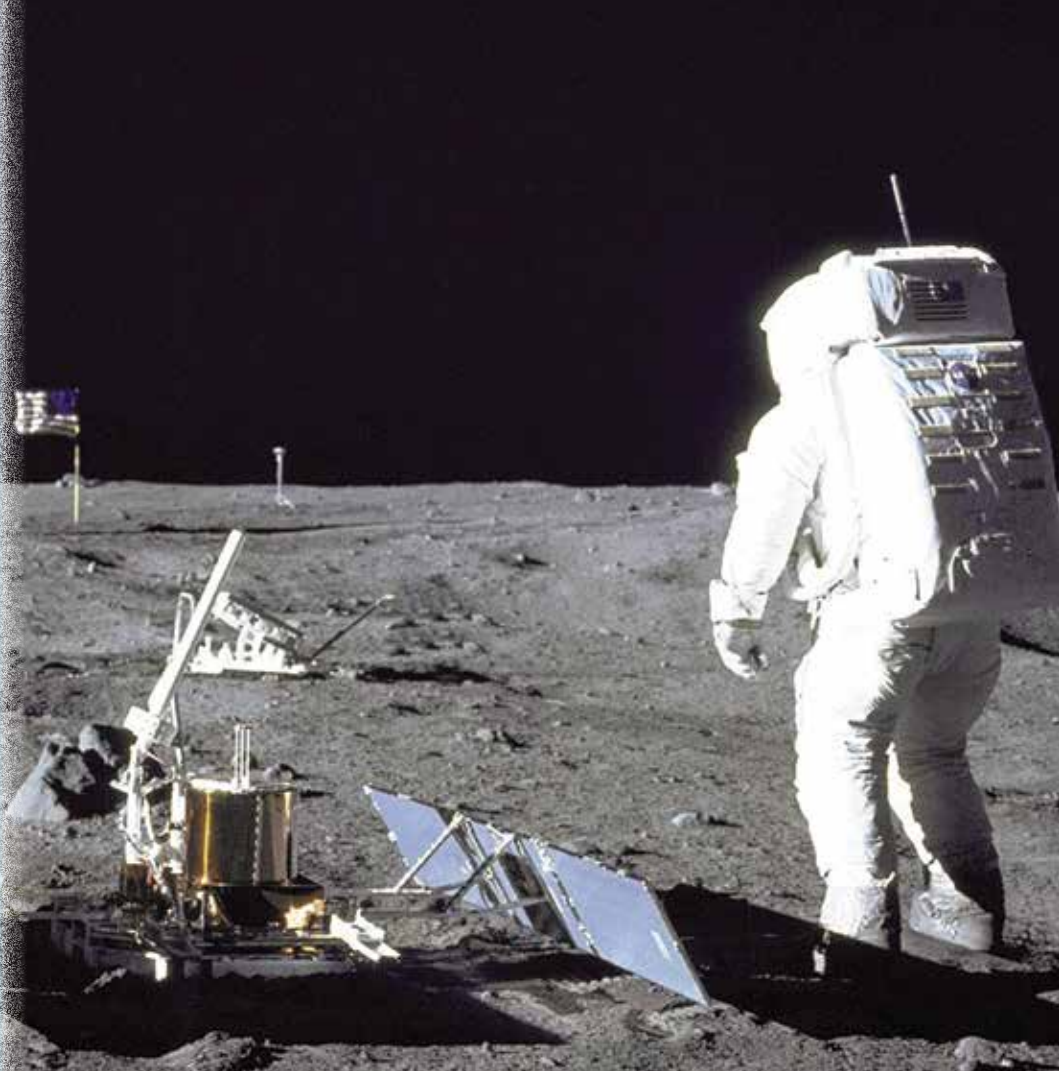
On July 16, 1969, Neil Armstrong, Buzz Aldrin, and Michael Collins sat strapped in *Saturn V*. They were about to make history. This was the Apollo 11 space mission, and their rocket would take them to the moon.

Four days later, Aldrin and Armstrong climbed into the Eagle lunar **module**. They headed to a spot on the moon known as the Sea of Tranquility. They radioed, "Houston, Tranquility Base here. The Eagle has landed." Back on Earth, the crew roared with joy. They had made it to the moon!

Neil Armstrong

Cutting It Close

There were only 30 seconds of fuel left in the Eagle when Armstrong landed on the moon. If it had taken him a few seconds more to land, they would have had to abort the moon landing.



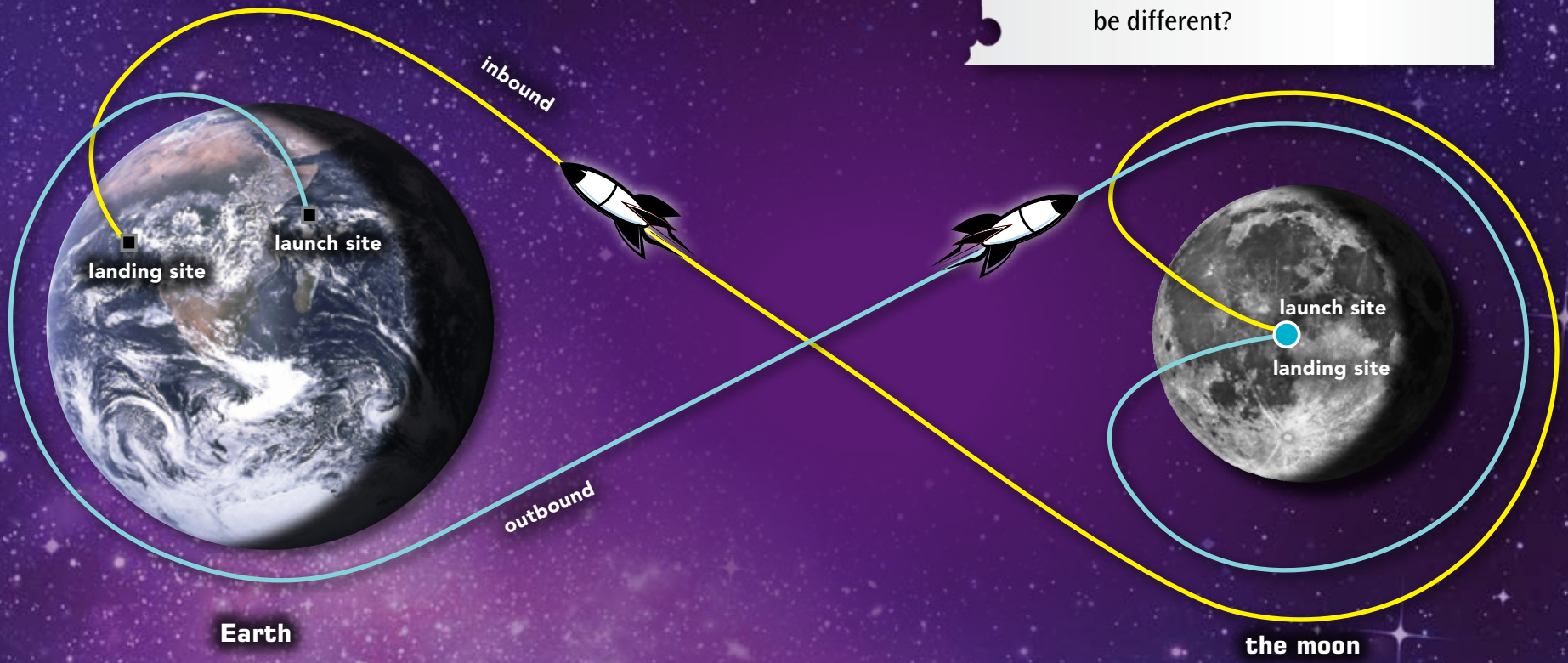
The Backup Crew

Actors have understudies in case they can't perform. The Apollo astronauts had backup crews for the same reason. These astronauts had to train just like the main crew. They had to be ready to take over if they were needed. They worked just as hard as the main crew, but none of the backups ever made it to the moon that summer.

Perfect Timing

Getting to the moon was no easy task. Every part of the journey was planned and plotted ahead of time. Astronauts knew what to expect each step of the way. And the timing had to be just right. Bad timing could lead to a **catastrophic** mistake. Every piece of equipment and every person had to be in the right place at the right time. If they made a mistake, they might not have reached their destination. And they wouldn't have had enough fuel to get back.

- Why are parts of Earth and the moon in shadow?
- What is the difference between the yellow and the blue lines?
- Why might the launch location and touchdown location on Earth be different?



IN THE DRIVER'S SEAT

The spacecraft that went to the moon didn't come back in one piece. Most of the spacecraft stayed in space. It had been built in sections. Each section played an important role in the mission. Once it was used, that part of the spacecraft wasn't needed. The only part to return with the astronauts was the small command module.

Anatomy of a Moon Rocket

Launch Escape System

In case of an emergency, this top-mounted rocket allows the crew to escape from the rest of the rocket quickly.

Command Module

The astronauts lived in the command module. This was the section that returned them to Earth.

Service Module

The service module had the astronauts' food, fuel, oxygen, and supplies. It stayed with the command module until it was no longer needed. Then, it burned up in the atmosphere. The command and service modules orbited the moon but did not go to the surface.

Lunar Module

The lunar module was designed to land on the moon. It had two parts. The landing stage stayed on the moon after the astronauts left. The upper stage flew back to the rest of the ship.

Engine

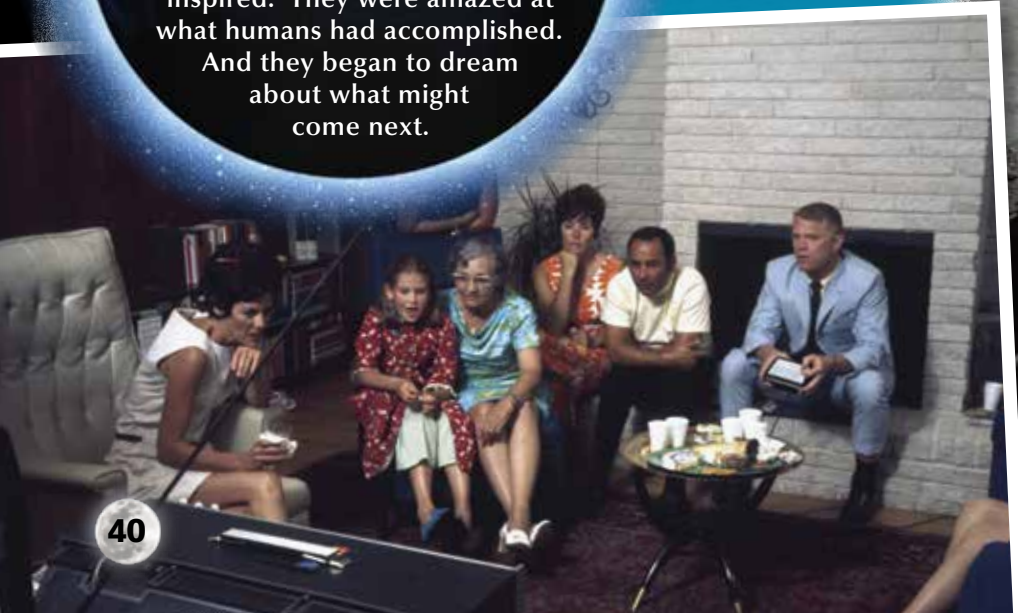
High temperatures and pressure improve engine performance.

MOONWALK

On July 20, 1969, Neil Armstrong became the first person to step onto the moon. On Earth, 500 million people watched. The astronauts were on television. It was thrilling! Armstrong announced, "That's one small step for man, one giant leap for mankind." Between 1969 and 1972, there were six successful moon missions. In all, 12 people have walked on the moon.

Watching From Home

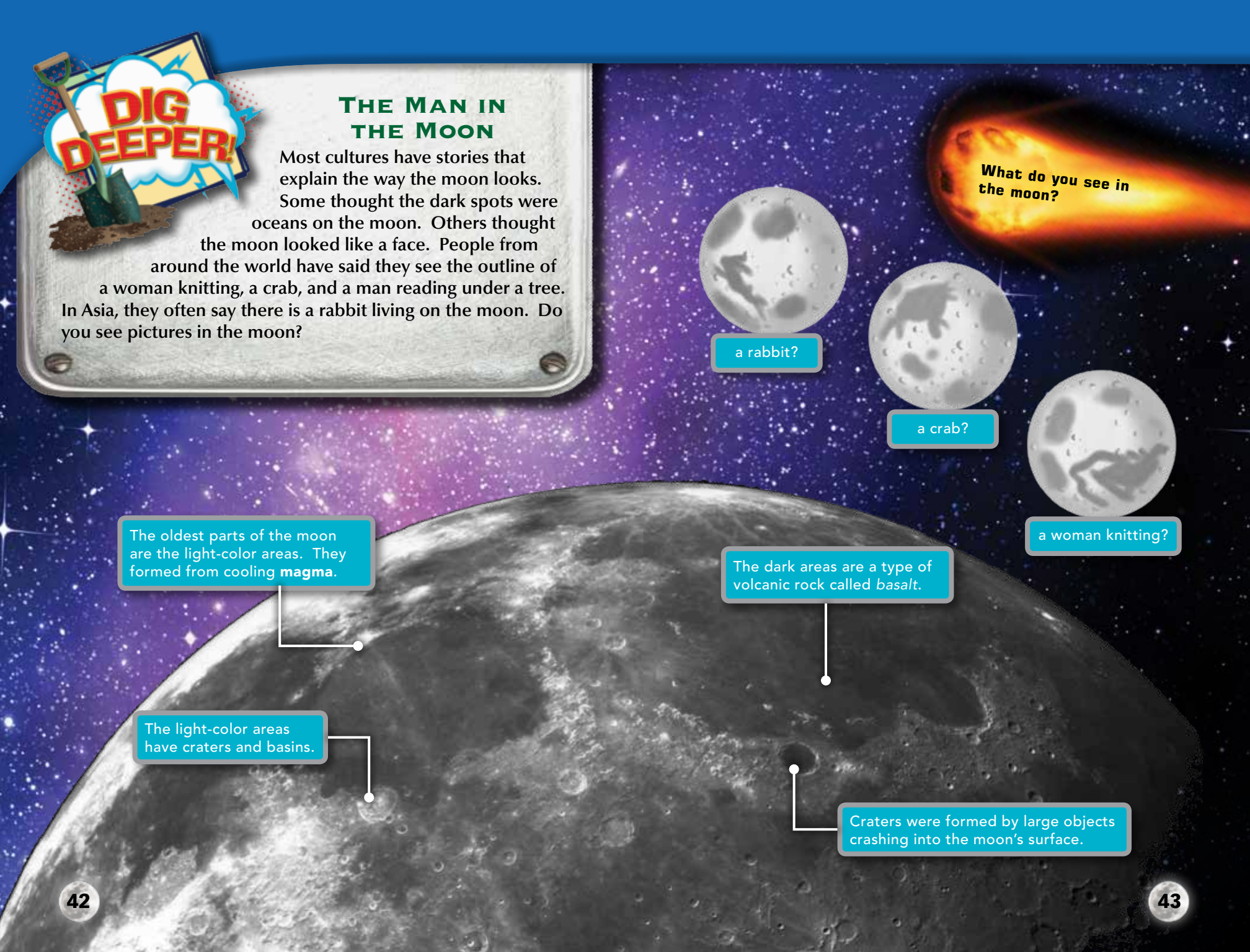
Imagine sitting in your living room with your family watching Neil Armstrong step out onto the moon's surface for the first time. How would you feel? Many people were inspired. They were amazed at what humans had accomplished. And they began to dream about what might come next.



Moon Plaque

The Apollo 11 crew left a plaque at their landing site. It reads:

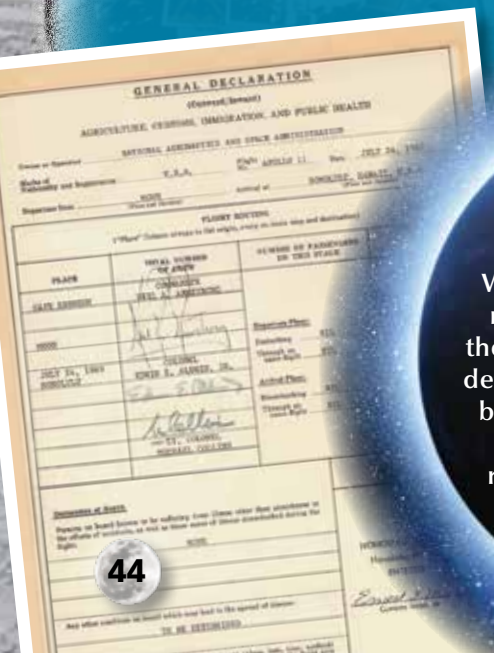
HERE MEN FROM THE PLANET EARTH
FIRST SET FOOT UPON THE MOON
JULY A.D. 1969
WE CAME IN PEACE FOR ALL MANKIND


DIG DEEPER!
The Man in the Moon
Most cultures have stories that explain the way the moon looks. Some thought the dark spots were oceans on the moon. Others thought the moon looked like a face. People from around the world have said they see the outline of a woman knitting, a crab, and a man reading under a tree. In Asia, they often say there is a rabbit living on the moon. Do you see pictures in the moon?
What do you see in the moon?
a rabbit?
a crab?
a woman knitting?
The oldest parts of the moon are the light-color areas. They formed from cooling **magma**.
The dark areas are a type of volcanic rock called *basalt*.
The light-color areas have craters and basins.
Craters were formed by large objects crashing into the moon's surface.

EXPLORING THE MOON

Throughout history, people have explored new lands. They had no idea what they would find. But they wanted to know more about these places. It's the same for astronauts, perhaps the greatest explorers in history. They had no idea what they would find in space. But they knew they wanted to learn as much about it as possible.

The moon is covered with leftover experiments. Discarded equipment from Earth still remains. Flags, lunar modules, and probes lie there. Some astronauts left behind **mementos**. One of the most useful tools that astronauts left on the moon was a laser reflector. Scientists on Earth can shine a laser at the reflector. Then, they measure how long it takes for the light to bounce back. Using the reflector, they have learned the moon is moving away from Earth. It moves slowly at a rate of about 1.5 inches each year.


GENERAL DECLARATION

AGRICULTURE, CUSTOMS, IMMIGRATION, AND PUBLIC HEALTH

Clearing Customs

When the Apollo 11 astronauts returned to the United States they signed **customs** documents, describing what they had brought back from the moon. The form says their cargo was "moon rock and moon dust samples" and is signed by all three astronauts.

A Lasting Impression

Apollo 16 astronaut Charles Duke left a photo of his family and a medal in a plastic bag on the surface of the moon. The astronauts also took samples of moon rocks and soil. They brought them back for scientists to study.

WHAT'S NEXT?

The first trips to the moon were only the beginning. The universe is vast. There is so much to learn and explore. There was never any problem thinking of new things to try. The only problem was figuring out which things to try next.

THE AGE OF SATELLITES

Sputnik 1 kicked off the space race. But it was only the first of thousands of satellites to be launched into orbit around Earth. Today, satellites let us make phone calls to most places on the planet. They keep track of the weather and do research. They help people on Earth navigate in cars, planes, and ships.

Traffic Jam

Right now, there are about 8,000 satellites orbiting Earth. Most of those are "dead" satellites or debris. But about 560 of them are **operational**.

What Did Sputnik Do?

Sputnik 1 didn't do much. Mostly, it just sent out a radio wave. Here on Earth, it sounded like a simple "Beep!"

Russian satellite GLONASS

Sputnik 1

SPACE SHUTTLES

In movies, people often take off and land on planets, using the same ship. When the space shuttle *Columbia* launched on April 12, 1981, science fiction became science fact. Space shuttles could go in to space and come back again. Before that, every mission required a different spacecraft. Shuttles were used to launch satellites. They carried pieces into space to create a **space station**. And they helped scientists do a lot of research.

Each shuttle was designed to be used about 100 times.

ALL GOOD THINGS COME TO AN END

After 30 years, the space shuttle program ended. The final mission was flown by shuttle *Atlantis* in July 2011.

SPACE STATIONS

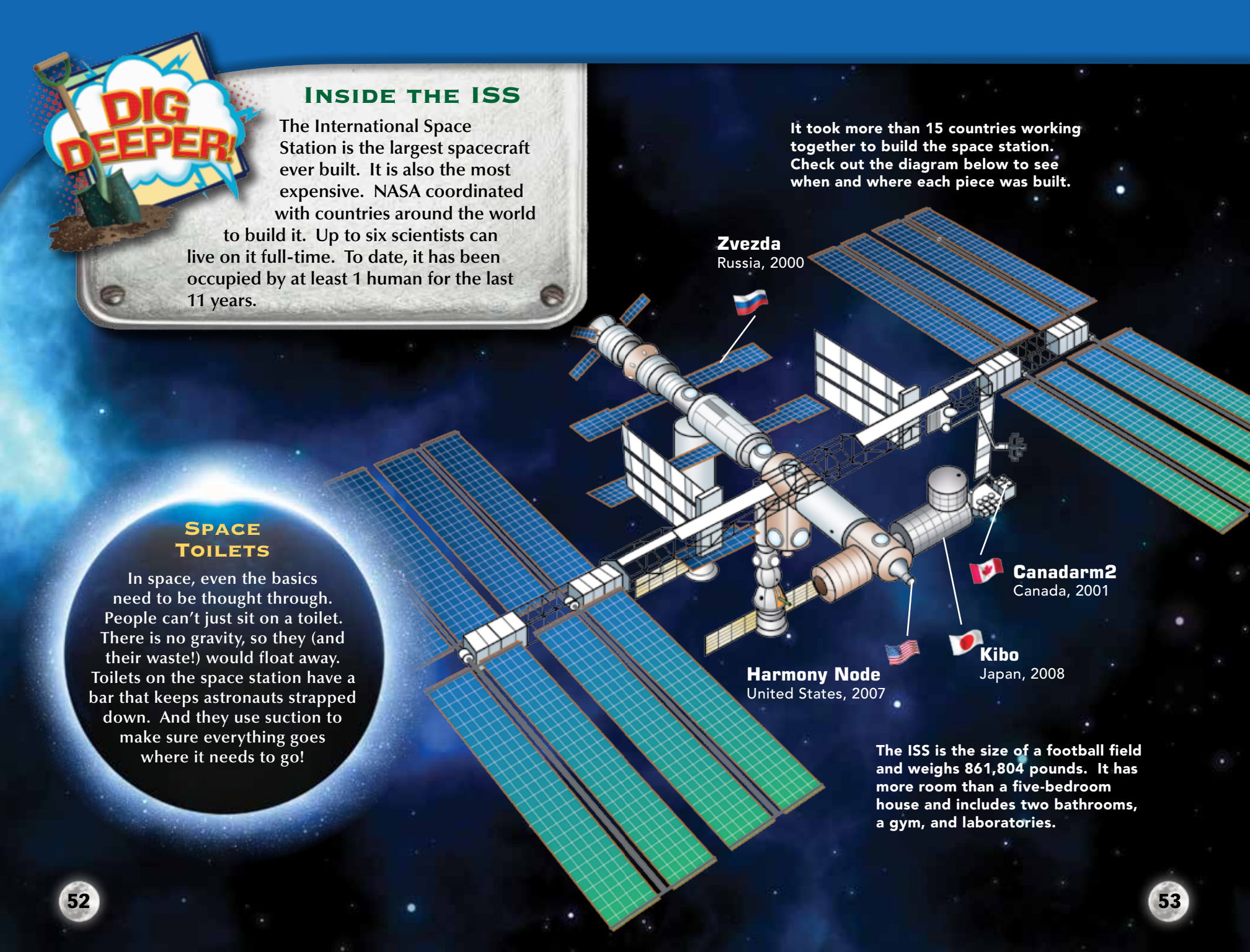
Space stations are large satellites. They allow astronauts to live and work in space for long periods of time. This lets scientists do experiments that take more time. The astronauts even perform tests on themselves. Doctors study their **vital signs** to see how humans survive in space. Space stations are usually sent up into space in pieces. Then, the pieces are attached. Many countries work together in the space stations that orbit Earth.

American and Russian scientists work together on the International Space Station (ISS).

Every 90 minutes, the International Space Station circles Earth.

COME TOGETHER

The ISS is the ninth space station to be built. Astronauts and cosmonauts from 15 nations have lived on the ISS.



Inside the ISS

The International Space Station is the largest spacecraft ever built. It is also the most expensive. NASA coordinated with countries around the world to build it. Up to six scientists can live on it full-time. To date, it has been occupied by at least 1 human for the last 11 years.

It took more than 15 countries working together to build the space station. Check out the diagram below to see when and where each piece was built.

Zvezda
Russia, 2000

Canadarm2
Canada, 2001

Kibo
Japan, 2008

Harmony Node
United States, 2007

The ISS is the size of a football field and weighs 861,804 pounds. It has more room than a five-bedroom house and includes two bathrooms, a gym, and laboratories.

Space Toilets

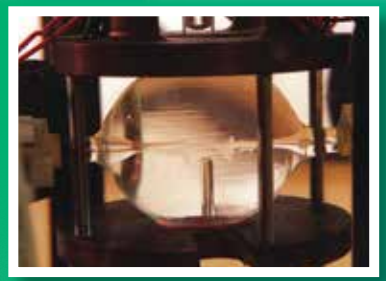
In space, even the basics need to be thought through. People can't just sit on a toilet. There is no gravity, so they (and their waste!) would float away. Toilets on the space station have a bar that keeps astronauts strapped down. And they use suction to make sure everything goes where it needs to go!

SPECTACULAR STATIONS

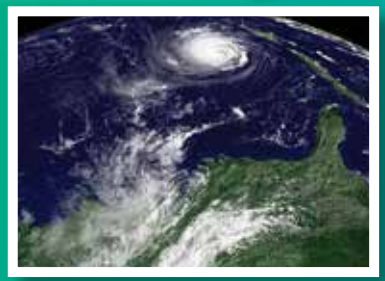
The first space station was the Soviet Union's Salyut 1. It was launched in 1971. The first American space station was Skylab. It was also the largest craft ever put into orbit. But Skylab was damaged in its launch, so it was only used for three missions. In 1986, the Russians launched Mir. It was used until 2001. China launched its first space station in September 2011. The Tiangong 1 will be the first of several sections. When all the pieces are in place, multiple spaceships will be able to dock at the same time.

Eyes in the Sky

Scientists use space stations to study our planet in ways that aren't possible anywhere else.



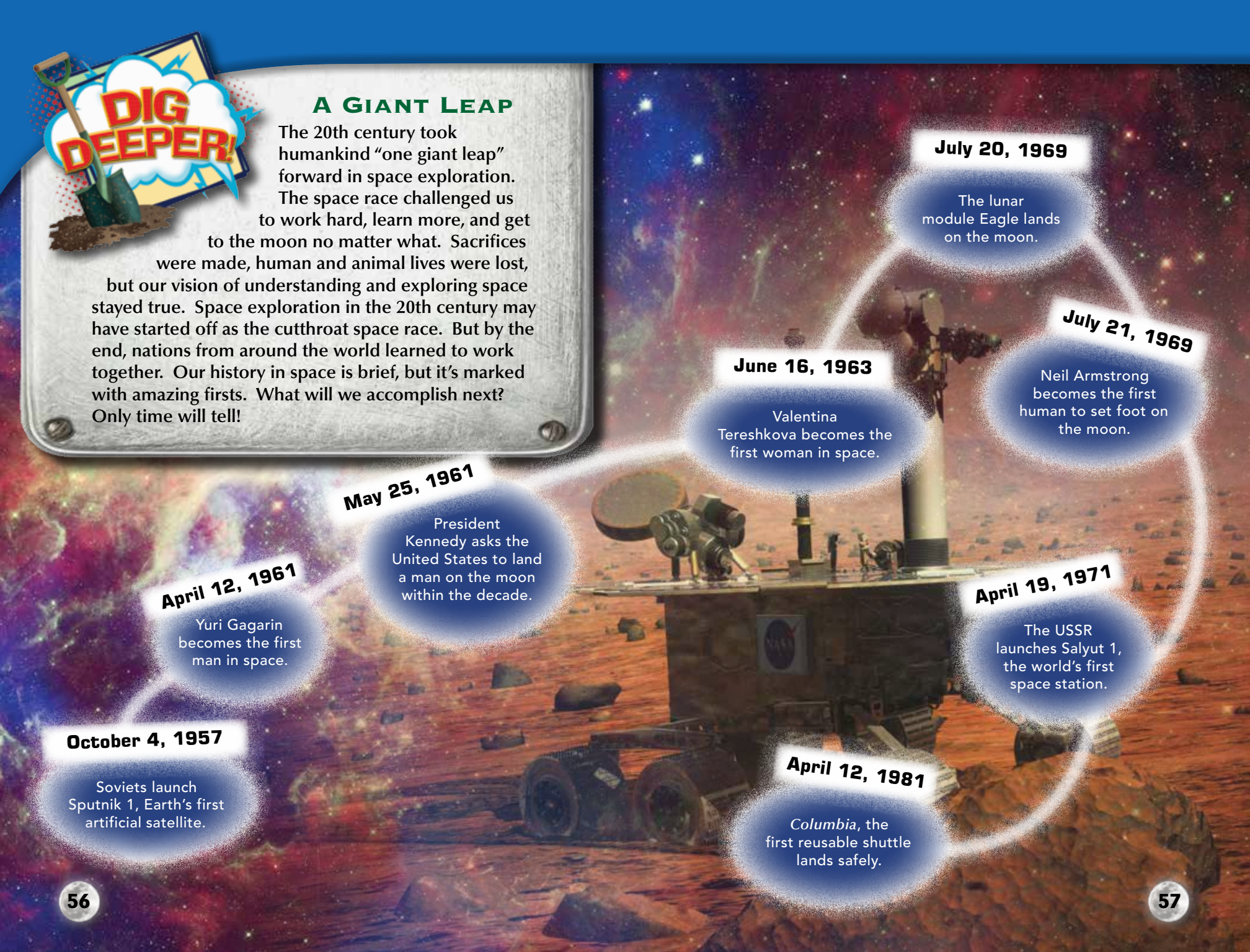
Growing special crystals in zero gravity may lead to faster computers or new ways to fight diseases.



Telescopes record changes in Earth's weather and study the big picture.

Space stations are great places to test how to grow food for future space explorers.

Many studies observe how humans deal with being alone in a small place for long periods of time.



A Giant Leap

The 20th century took humankind "one giant leap" forward in space exploration. The space race challenged us to work hard, learn more, and get to the moon no matter what. Sacrifices were made, human and animal lives were lost, but our vision of understanding and exploring space stayed true. Space exploration in the 20th century may have started off as the cutthroat space race. But by the end, nations from around the world learned to work together. Our history in space is brief, but it's marked with amazing firsts. What will we accomplish next? Only time will tell!

October 4, 1957

Soviets launch Sputnik 1, Earth's first artificial satellite.

April 12, 1961

Yuri Gagarin becomes the first man in space.

May 25, 1961

President Kennedy asks the United States to land a man on the moon within the decade.

June 16, 1963

Valentina Tereshkova becomes the first woman in space.

July 20, 1969

The lunar module Eagle lands on the moon.

July 21, 1969

Neil Armstrong becomes the first human to set foot on the moon.

April 19, 1971

The USSR launches Salyut 1, the world's first space station.

April 12, 1981

Columbia, the first reusable shuttle lands safely.

GLOSSARY

assassinated—murdered a government official or other public figure
astronauts—space travelers from the United States, also a general word for space travelers
catastrophic—disastrous
Cold War—a time period between 1945 and 1991 when the USSR and the United States were enemies but not openly fighting each other
cosmonauts—space travelers from the USSR or Russia
customs—the government agency or procedures for collecting fees charged for bringing goods into or out of a country
earthrise—the view of Earth becoming visible over the horizon of the moon
magma—a hot fluid beneath or within a planet or moon's crust
mementos—objects kept as reminders of past events
missiles—objects that are thrown, shot, or launched to hit something at a distance
module—a complete piece that is part of a bigger structure
operational—able to function
overview effect—the change that happened in people's attitudes when they were able to see Earth from space for the first time
rockets—spacecrafts that are powered by a rocket engine with gases that are released from burning fuel
satellite—an object that orbits Earth

Soviet Union—a country that existed across Europe and Asia from 1917 to 1991; also known as the USSR
space euphoria—a feeling of happiness and connection to the Earth and its people caused by seeing Earth from outer space
space race—the competition to be the first country to achieve goals in space exploration
space shuttle—a kind of spacecraft that can return to Earth and be reused
space station—a large satellite where scientists live for months at a time
Union of Soviet Socialist Republics (USSR)—a former group of 15 republics that spanned Europe and Asia, all of which are now separate countries
vital signs—the pulse rate, body temperature, number of breaths taken per minute, and blood pressure of a person

INDEX

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This graphic novel tells the story of the Apollo 11 mission. It includes a real astronaut-to-mission control conversation, a map of moon landings, and fun illustrations.

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Astronaut Buzz Aldrin tells the story of his historic journey to the moon. His journey started before he was an astronaut—it began when he was a young child. Learn more about Aldrin, his dreams, and how they came true.

Starke, John. *High Definition 3D Space*. Sterling, 2009.

Get ready to blast off into space! You will fly the space shuttle, land on the moon, visit a space station, and more. With your 3-D glasses, you'll experience deep space like never before! Don't forget to answer the debriefing questions after your mission.

Wolfe, Hillary. *Blast Off to Space Camp*. Teacher Created Materials, 2011.

Find out if you have what it takes to be an astronaut. Check out what it's like to train for a space mission, wear a flight suit, and live in zero gravity as you learn about NASA's world-famous space camp.

MORE TO EXPLORE

We Choose the Moon

http://www.wechoosethemoon.org

Click *Launch* to hear real recordings from mission control as you see Apollo 11 take off. Each leg of the journey has pictures, videos, and audio from this historic launch.

Walking on the Moon

http://www.smithsonianeducation.org/idealabs/walking_on_the_moon/index.html

What did it take to put people on the moon? What were the dangers? Who were the astronauts that first stepped onto the moon? All these questions and more will be answered as you relive the mission.

Apollo 11

http://www.nasa.gov/externalflash/apollo11_landing

This video features the first manned lunar module to land on the moon. You will hear authentic audio from the mission throughout the video. You can also watch the footage from Apollo 11's launch and view a 360º view of the surface of the landing site while listening to the transcript of the account.

Facts About the Moon

http://www.woodlands-junior.kent.sch.uk/time/moon/facts.htm

Learn more about Earth's moon. From its effect on the tides to the phases of the moon, this site has lots of information. You will also find tips for watching the moon as it goes through its different phases.

ABOUT THE AUTHOR

Stephanie Paris grew up in California. She received a degree in psychology from UC Santa Cruz and a teaching credential from CSU San Jose. She has been an elementary classroom teacher, an elementary school computer and technology teacher, a home-schooling mother, an educational activist, an educational author, a web designer, a blogger, and a Girl Scout leader. Ms. Paris currently lives with her husband and two children in Germany where she enjoys moon watching.