Ten Milestones in Space

	Text Type	Lower 1500–1800 words RA 8.8–9.2	Middle 1900–2400 words RA 9.3–9.7	Upper 2500–3000 words RA 9.8–10.2
Fact	**Procedure**	Build Your Own Easel	Making a Cheesecake	So You Want to Be a Cartoonist?
	Recount (Explanation)	Ten Milestones in Space	Rail Accidents	Three Terrible Hurricanes
	Information Report (Description)	Mythical Creatures	The World of Caves	Top Towers
	Information Report (Explanation)	A Weather Counting Book	Two Polar Regions	Seven Ancient Wonders
	Interview	Food Science FAQs	Hobbies	Fireflies and Glow-worms
	Biography	Ned Kelly	Mother Teresa: Saint of the Gutters	Edmund Hillary
	Explanation	How Forensic Scientists Work	How Musical Instruments Work	How Solar Energy Works
	Procedural Recount	How I Learned to Be a Nipper	How I Trained for the Junior Triathlon	How I Learned to Snowboard
Fiction	**Realistic Fiction** (Out of School)	Junkyard Treasure	Outback Betty's	Harry's Dream
	Realistic Fiction (In School)	On the Case	The Real-Life School Project	Ms McMahon
	Historical Fiction	The Wooden Horse Trick	Cheung Saves the Day	The Slave
	Fantasy	The Cloud Washerwoman	Sammy Stevens Sings	Finbar and the Long Trek
	Science Fiction	A New Source of Power	The Intergalactic Race	Eighth Moon
	Humour	The Upstairs Dragon	My Rhyming Grandpa	Catty Bimbar and the New-Age Pirates
	Mystery	Mystery Under the Big Top	The Mystery of Autoplane 500	The Mystery of the Missing Food
	Folktales	The Wicked Witch of the Singing Sands	Gulnara	Momotaro, Little Peachling

MACMILLAN

We have designed these lesson plans so that you can have the plan in front of you as you teach, along with a copy of the book. Suggestions for teaching have been divided into questions and discussion that you may have with students before, during, and after they read. You may prefer to explore the meaning and the language in more detail before students read. Your decisions will depend on the gap between students' current knowledge and the content, vocabulary, and language of the book they are about to read. The more information students have up front, the easier it will be for them to read the text.

TEN MILESTONES IN SPACE

Lower level fact
Text type: Recount (Explanation)
Reading age 9.2
Word count 1,745

Before Reading

Activate prior knowledge by asking students what they know about space travel. Guide the discussion to build knowledge if required. *What do you know about space exploration?* Discuss events like the first landing on the moon. *What made this event so significant? Do you think it is difficult or dangerous to embark on exploration into space? Why?*

What types of things have been sent into space? Discuss. Generate vocabulary during the discussion. Guide the discussion to include some of these words: satellite, orbit, astronaut, cosmonaut, rocket, atmosphere, shuttle, and space station.

Do you think that each time there was a successful mission into space it would be considered an important milestone? Discuss the meaning of the word *milestones*. Discuss the milestones when learning to walk, eg. sitting to crawling to standing to walking to running.

COVER

Before Reading

Read the title and examine the cover photograph. Discuss what the book may be about. *What things do you notice? What does this cover suggest? What are the names of these things? What does the word* milestones *mean?*

Read the blurb. What additional information does this give you? What do you expect to find inside this book? Guide the discussion to build understandings that this book will provide information about things that happened in space. Discuss the term *space history*. *What is history? What would you expect space history to be? What could some of the milestones in space history be?*

- *Who do you think is recounting the information?*
- *What do you think it means to* relive the first space walk?
- *What is the purpose of this book?*

CONTENTS PAGE

Open the book. Discuss the features of the contents page. *Where would I go to read about Milestone 3?* Students should quickly respond with the page number. Repeat for other pages. Encourage quick responses. *What do you know about information books?* Students should indicate that the reader can choose where they'd like to start.

Students should also mention the terms *glossary* and *index*. Ask students to explain what each term means. Visit each of these pages to clarify that the glossary provides meanings for new or tricky words about the topic, and the index provides the page numbers to help the reader locate particular things in the book.

Revisit the contents page. Discuss the term *introduction*. *What does this mean?* Lead students to acknowledge that an introduction will provide background information about the topic which will help us read the book.

INTRODUCTION

During Reading

What do you notice first about this page? Guide students to discuss the information contained in the illustration. Ask students to read the caption and look at the picture on page 4. *How long is a century? What is an astronomer? What do you notice about the image on page 5?* Read and discuss the caption with students.

What do you notice when you look at the text? Students should identify the bold text. *What does this tell us?* Students identify that these words are explained in the glossary. Instruct students to navigate quickly to the glossary to view these terms.

After Reading

What does the term milestones *mean?*

What does the term another great feat *mean?*

What are some of the milestones that have been achieved in the last 100 years? Discuss. Direct students to revisit page 5. *What is Mir? What is special about Mir?* Invite students to offer that Mir was a permanent station on which people could live.

What other great feat occurred? Discuss the importance of putting a telescope into space. *Why was this important?*

We read of a recent milestone that took place in 2000. What was this milestone? Discuss the term International Space Station and why it was such an important milestone. *How would you feel living on a Space Station? What do you think it would be like?*

What happened in 2005? Why might a repair in space be challenging?

MILESTONE ONE

During Reading

Read the title. What is a satellite? Discuss. *Tell me about the image on this page.* Discuss the photograph and read the caption. *Do we know what Sputnik 1 was?* Discuss the illustration and encourage discussion by students who may have heard the name before.

Read page 6. As you read, find out about the first satellite in space. We know that it was the size of a basketball. Jot down any important points about this satellite, for example, its country of origin, when it was launched into orbit, how long it was in orbit and what information was gained.

Remember to visit the glossary when you read a word in bold type.

After Reading

What did you discover about the first satellite? Encourage students to share the information they recorded about *Sputnik 1*.

What does the name Sputnik 1 *mean? Do you think this name was chosen deliberately for the satellite?* Encourage students to explain.

What information did Sputnik 1 *send back to Earth? How could radio signals be useful?* Invite inferences.

How did Sputnik 1 *get back to Earth? Do we know whether* Sputnik 1 *just fell back to Earth, or whether its entry back into the atmosphere was controlled?* Refer students to page 6 to check. Invite inferences about the question.

MILESTONE 2

During Reading

Read the title. Look at the photograph. What do you think the first living being in space was? Read the caption and see what else it tells you. What is the dog's name? Describe Sputnik 2. Students should indicate that it was very small. *How much space did Laika have on the satellite?*

Read page 7. As you read, find out about the aim of Sputnik 2*. Also find out why a dog was sent into space. Jot down some notes about when the event occurred and whether this was considered an important event. Find out what happened to Laika.*

After Reading

What was the reason for sending Laika into space? Why do you think a dog was sent, and not a person? Discuss*. What was the effect on Laika's body? How long did she survive? Why do you think it was important to find out about the effects of space travel on a live being?* Invite students to infer. Guide the discussion to build understandings that this provided important information that would guide how space craft would need to be constructed to support life. *How is Laika remembered?*

When was Sputnik 2 *launched into space? How long after* Sputnik 1 *was this? Why do you think the launches were so close together?*

What does the timeline at the bottom of the page tell you?

MILESTONE 3

During Reading

Read the heading. What milestone is reached on page 8? What does the photograph show? Which country do you think this rocket is from? Read the caption and see if it gives you a clue. Discuss the name *Vostok*. *Does this launch look more advanced that the two* Sputnik *satellites? Why?* Encourage discussion. Probe for elaboration and collaboration where needed.

Read pages 8 and 9, and find out how much later this launch occurs. Jot down some of the noteworthy factors of this event. Be ready to discuss what the purpose of the mission was and what was gained from the trip.

Find out why this launch was an important milestone and think about how Laila's death may have been important to the success of this mission.

Remember to check the glossary words where you need to.

After Reading

What did you find out about the Vostok*? What was special about this mission and how might Laila's death have assisted this mission?*

What did the Vostok *do when it was in orbit? Who was aboard the spaceship? Were there any concerns about sending the cosmonauts into space?* Discuss the concern that Yuri's ability to work was not assured. Ask students

why this may have been a problem. Encourage elaboration as students infer.

What were Yuri's first words in space? How else did he describe how Earth looks from space? How did Yuri get back to Earth? How far above Earth did he eject? What do you think that would have been like for him?

What happened in 1963? What was the woman's name? Do you think it was a big deal for a woman to go into space? What did she do there?

Look at the time line at the bottom of the page.

MILESTONE 4

During Reading

Read the title on page 10. What is this section about? What do the photographs suggest to you? Read the caption on page 10. Can you predict the country these people are from? Who seems to be leading the space race at this stage? What does the photo and caption from page 11 show? What do you think we can see below the Voskhod 2*. Discuss.*

Read pages 10 and 11 and find out what the next milestone is. It is clear that the cosmonauts are outside their spaceships. Find out what they are doing and what it is like for them.

Be ready to share the successes and mishaps of this mission.

After Reading

What did you discover about this mission? What did the cosmonauts do that had never been done before? What was it like to be out of the spaceship? Why does this happen? Discuss the lack of gravity. Revisit the glossary with students to ensure that students understand the notion of gravity. Discuss life on Earth and what gravity enables us to do. Link back to rockets launching*. Do you think it is hard to push against gravity?*

What are the successes of this mission? Encourage discussion about what was learned and of the cosmonauts leaving the safety of the cabin in the spaceship.

What mishaps occurred? Discuss the events on page 11. Refer students to the text if needed. *Do you think the cosmonauts were fortunate to escape with their lives?* Discuss*.*

Look at the time line at the bottom of the page.

MILESTONE 5

During Reading

Read the title. What is the fourth milestone? Which country is this? Look at the photos and find out. Prompt students to look at the flag on page 13. *What do the captions say? Read each caption and discuss. Why do you think there is no wind on the moon? What did they do to the flag?*

Read pages 12 and 13. Be ready to discuss this milestone. Find out who walked on the moon and think about how this may have felt. One of the astronauts made a statement that became famous. Write this statement down and think about what it means.

After Reading

Who walked on the moon? What statement was made that was later to become famous? Think about those words, "That's one small step for man, one giant leap for mankind." What does this mean? Discuss*.*

What did Armstrong and Aldrin do on the moon? How long were they there? Why do you think it was important to collect samples of rock and dust? Discuss*.*

Turn over to pages 14 and 15. This is called a diagram. It is important to read a diagram, just as we read the words. Diagrams contain lots of information. How does this diagram show us the order of events? Discuss what is happening at each step of the diagram. What is the purpose of this diagram? Discuss.

Look at the time line at the bottom of the page.

MILESTONE 6

During Reading

Read the heading. What is a space shuttle? Look at the photograph on page 16. Read the caption. What do you know about Columbia*?* Invite students to say that it made 28 flights into space. *What do you notice about how it looks compared to the rockets?*

As you read page 16, find out what is special about the shuttle. What special features does it have? Jot down what they are and be ready to discuss what makes it a better craft for astronauts.

What did the Columbia do when it was in space?

After Reading

Discuss the special features of the shuttle. Encourage students to revisit the text if necessary to clarify information and to check for extra details. *What are the protective shields for? What was special about how the shuttle took off and landed? How did this landing improve safety for astronauts? The space shuttle was a very successful initiative. How do we know that?* Direct students to the text. Tell them that the answer is not obvious, and they will need to read and then do some thinking on their own. Guide students to understand that if the shuttle made 28 flights it must have been a success.

Look at the time line at the bottom of the page.

MILESTONE 7

During Reading

Read the heading. What is Mir*? Do you recall what we read in the introduction? Look at the photo and read the caption to see if it reminds you.* Discuss what students can recall. Revisit the introduction to build knowledge if needed.

As you read pages 17 and 18, jot down the things that make Mir *different from the other milestones so far. Jot down what* Mir *enabled astronauts to do and learn.*

Find out how long Mir *was orbiting Earth and what problems occurred in that time. Be ready to chat about what finally happened to* Mir*.*

After Reading

In what ways was Mir *different from the other milestones?* Discuss that it stayed in space for a long time, that the US and Russian presidents agreed to work together, and that the astronauts could live in space for periods of time.

Discuss the problems that occurred on *Mir*. Direct students to revisit page 18 if necessary to check or clarify. *How do you imagine that you would feel being in space and being on a craft that was on fire?* Discuss the collision with the cargo ship. *How do you think the astronauts would have evacuated? How could they return safely to Earth?* Encourage students to infer.

What happened in 2001? Was anyone on board? How long had Mir *been in space?*

Look at the time line at the bottom of the page.

MILESTONE 8

During Reading

Read the title. What is the Hubble Space Telescope? Invite students to share their knowledge or make inferences. *Do you expect that it would be a normal telescope?*

As you read page 19, think about how the Hubble space telescope is able to provide important information to scientists. Jot down some of the problems with Hubble in the early stages and be ready to share the successes since improvements were made.

What amazing images was Hubble able to send to Earth in 1995? Why do you think this information may be important? What might scientists learn from these images?

After Reading

What is special about the Hubble space telescope? How did the Hubble get into space? Direct students to reread the top of page 19 to find out if needed. *How strong was the Hubble? Why did it need to be so much stronger than telescopes on Earth?* Invite inferences.

What were some of the problems with Hubble? How were they rectified?

What have scientists learned from the images Hubble sent to Earth? Why do you think seeing images about stars being born would be helpful to scientists? Invite inferences and probe for clarification where needed.

Look at the time line at the bottom of the page.

MILESTONE 9

During Reading

Read the title. What does the term international *tell us? What is an International Space Station?*

As you read page 20, find out what makes the International Space Station a great milestone. Take note of when astronauts began to live on board and what their job is. Jot down some things that are interesting and important about the space station. Be ready to share your thoughts about the ways the astronauts on board may go about their daily lives. How might living on board a space station be challenging?

After Reading

Why was the International Space Station a great milestone? Discuss that scientists from all over the world collaborated to build the station. *Why do you think some of the world's best were brought together for this project?* Invite inferences.

What is special about what the International Space Station does? Discuss that it permanently orbits Earth. *What sort of information might astronauts send back to Earth? How many astronauts live on board at any one time? What does the term* at any one time *suggest?* Support students to understand that it implies that the same astronauts are not kept on board the International Space Station all the time.

How do you think it would feel to be living the way the astronauts are?

Look at the time line at the bottom of the page.

MILESTONE 10

During Reading

Read the title. What is the tenth milestone? In what ways can you imagine that repairing a space shuttle while still in space would be difficult? Invite inferences.

On page 21 you will find out the answer. As you read, take note of what caused the problem on the shuttle, and what was involved in the repair. Jot down some points to help you to remember. Consider the sorts of things that would make this a very dangerous thing to do.

As you read, think about what may have happened if the shuttle was not repaired.

After Reading

Why did the shuttle need to be repaired? What do you think heat shields are? Think about the words separately and then put them together. What was sticking out of the heat shields? What was this material used for? Check page 21 if needed. Why did the scientists think it was important to repair it in space? Direct students to reread the middle of page 21 to check if needed.

Who repaired the shuttle? How did Steve Robinson do it? What problems could have occurred during the repair? Why do you think this was a significant milestone? Invite inferences.

Examine the time line at the bottom of the page.

CODE BREAKER

Explain to students that the names of things from other languages can be difficult for us to read when we see them in books. Build students' understandings that this is because the patterns and ways that sounds go together may sound different to the way they commonly sound in English.

Direct students to search quickly through the book and record the names of things that are challenging to pronounce or read. Explain that some are easy for us to use our knowledge of single sounds or parts we know. For example, *Valentina* is one that can be broken down into its parts and the combination of letters placed together is not greatly different from English. *Tereshkova* is a little different, because we don't place a *k* immediately after the digraph *sh*. However we can still use our knowledge of how sounds can be segmented together to work it out. Explain that in Russia the ending *–kova* is not uncommon in people's names. Ask students to think of some tennis players that they know.

MEANING MAKER

Support students to make text to text links. Ask students to brainstorm all the books, films, shows, cartoons, etc, they can think of that feature the space theme and similar technologies as in *Ten Milestones in Space*.

List students' suggestions in columns for them to see. Use the headings Books and Shows. As students brainstorm their ideas, list the key elements that are suggested that link to ideas from the text. For example, students may say *Star Wars*. Ask them what elements of that film remind them of the book. Support them to understand that some of the space craft in the movie have similar design principles to the shuttle design. Ask students to explain what these similarities are. Continue the discussion for the other suggestions.

TEXT USER

Tell students that if we know how to use the 'little extras' in an information book, it supports us to read the book and understand what it is about.

Turn to page 6. What is at the bottom of each page through this book, to help us to see the progression of the milestones? Students should identify that it is a time line. *How do we read a time line?* Discuss that information is placed along a scale that runs left to right, just as when we read books. On this book it is a horizontal scale, but sometimes they use a vertical scale. *What information does it give us at a glance?* Invite students to respond that on this time line, we see *when* things occurred.

Have students draw a vertical time line and transfer the information from the time line in the book onto the time line they have drawn.

TEXT CRITIC

Explain to students that books are written for different purposes. This book has been written to build knowledge of the world around us. With a partner, list all the books in the classroom that you think are designed to build your knowledge of the world around you.

Make another list of books you think have been written to entertain you. Even though the list-two books provide entertainment, they often teach a message about how to solve problems, deal with our friendships, act in certain situations, understand others, etc.

Discuss the lists of books and ask students to generalize what the books from list one have in common with each other and what the books from list two have in common with each other.

USING MULTIPLE INTELLIGENCES

Work in pairs or small groups.

Construct: something from the book. You will need to look closely at the illustrations and reread that section of the book to find all the information you need. Discuss the materials you need for your design with your teacher. (S, B, P)

Record: the important aspects of your design. Use the book to help you. (V)

Compose: an interview. One person is the interviewer. The other person/people are astronauts/cosmonauts (choose people from the book). As a group, think of six interesting questions to ask the astronauts and six interesting and informative responses. (P)

MULTIPLE INTELLIGENCES

The theory of multiple intelligences was developed by Howard Gardner, a professor of education at Harvard University. Howard Gardner's theory suggests that the current view of intelligence, as measured by IQ tests, is far too limited and discriminates against students who think in different ways. He proposes taking a broader perspective and has identified eight different intelligences. These are:

- verbal-linguistic intelligence – word smart
- logical-mathematical intelligence – number/reasoning smart
- visual-spatial intelligence – picture smart
- bodily-kinaesthetic intelligence – body smart
- musical-rhythmic intelligence – music smart
- interpersonal intelligence – people smart
- intrapersonal intelligence – self smart
- naturalist intelligence – nature smart

Multiple intelligences have enormous potential as a tool in furthering reading and language development. Traditionally, the teaching of language and reading has focused mainly on two intelligences: logical-mathematical and verbal-linguistic. This means that many students who possess different intelligences do not receive the necessary opportunities, encouragement, instruction, or reinforcement to succeed with reading as well as they might.

Ten Milestones in Space Name _____

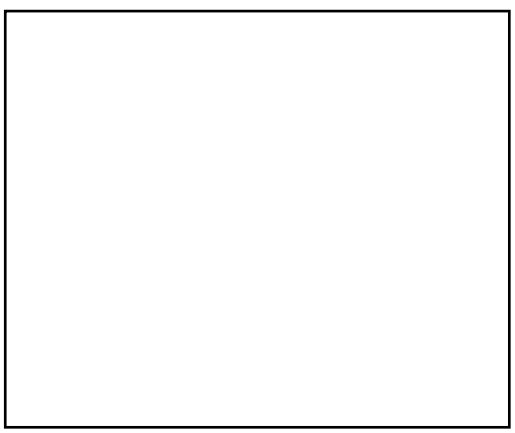
Record the date for each milestone. Record important notes about the ten milestones.

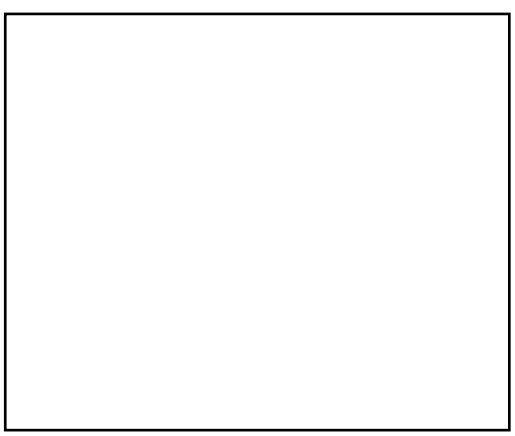
	Date	Notes
Milestone One		
Milestone Two		
Milestone Three		
Milestone Four		
Milestone Five		
Milestone Six		
Milestone Seven		
Milestone Eight		
Milestone Nine		
Milestone Ten		

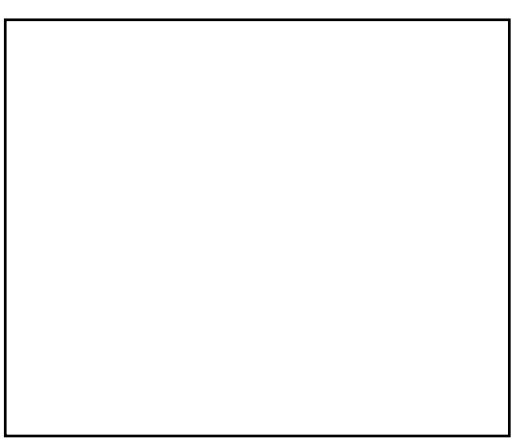
Ten Milestones in Space Name _____

Multiple Intelligences (interpersonal)

The astronauts on the International Space Station are bored. Think of some games and entertainment for them. Keep in mind the sorts of things they can do in a space station. Draw and write about them.







Ten Milestones in Space Name _____

Think about the ten milestones. Rate the milestones in order from least significant (number 1) to most significant (number 10). Give reasons for your choices.

The first satellite in space	The first spacewalk
The first living being in space	The first men on the moon
The first man and woman in space	The first space shuttle
M*ir*	The Hubble space telescope
The International Space Station	Repair of the space shuttle while in space

Reasons for my choices:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

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Ten Milestones in Space Name _____

Build or adapt a word from the one in brackets to make the sentences sound right.

1. It was on October 4, 1957, that the USSR _____ (launch) a ball-shaped satellite named S*putnik*.
2. Laika was the first _____ (live) being in space.
3. Yuri's first words in space _____ (was), "I see Earth. It's so beautiful."
4. They _____ (need) oxygen so that they can breathe.
5. The spaceship began _____ (tumble) out of control.
6. The crew spent a night in the forest, _____ (wait) to be rescued.
7. They _____ (gather) rock and dust samples.
8. The flag has an extra pole on top to keep it _____ (fly).
9. The first astronauts _____ (go) to the moon.
10. M*ir* was _____ (build) so that astronauts could live in space.

Build words from these:

For example, improve – improves, improved, improving, improvement

send _____

float _____

rescue _____

eject _____

launch _____

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Ten Milestones in Space Name _____

Write five things you know about milestones in space that you did not know before you read this book.

_____

_____

_____

What was the most interesting part of this book? Explain.

_____

_____

_____

What was the saddest part of this book? Explain.

_____

_____

_____

What was the most exciting part of this book? Explain.

_____

_____

_____

What did you learn about astronauts that you didn't know before?

_____

_____

_____

Ten Milestones in Space Name _____

Write the advantages and disadvantages of living on board the International Space Station.

Advantages	Disadvantages

What do you think would be the best thing about being an astronaut?

_____

_____

What do you think would be the worst thing about being an astronaut?

_____

_____

Ten Milestones in Space Name _____

Think of one question to ask about each milestone that wasn't addressed in the book.

The First Living Being in Space

_____

_____

The First Man and Woman in Space

_____

_____

The First Spacewalk

_____

_____

The First Men on the Moon

_____

_____

M*ir*

_____

_____

International Space Station

_____

_____

Repair of Space Shuttle while in Space

_____

_____

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