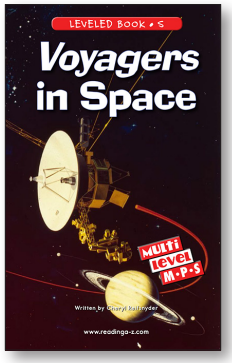
Voyagers in Space



About the Book

Text Type: Nonfiction/Informational **Page Count:** 16 **Word Count:** 952

Book Summary

Two unmanned *Voyager* spacecraft were launched in 1977 with a mission of studying the large outer planets of our solar system. *Voyagers in Space* describes their journeys, the information the *Voyagers* learned about the giant planets, and their current task of exploring deep space. Photographs, diagrams, and time lines support the text. Build on students' intrinsic interest in space exploration to teach about distinguishing between fact and opinion and using past-tense verbs.

Book and lesson are also available for Levels M and P.

About the Lesson

Targeted Reading Strategy

- Ask and answer questions

Objectives

- Ask and answer questions to understand text
- Distinguish details as fact or opinion
- Identify and use past-tense verbs
- Recognize and use open compound words

Materials

Green text indicates resources are available on the website.

- Book—Voyagers *in Space* (copy for each student)
- Chalkboard or dry-erase board
- Sheets of paper
- Photographs of astronomical objects
- Photograph for each story-critical vocabulary word
- Highlighters
- Fact or opinion, past-tense verbs, compound words worksheets
- Discussion cards

Indicates an opportunity for students to mark in the book. (All activities may be demonstrated by projecting the book on an interactive whiteboard or completed with paper and pencil if the books are reused.)

Vocabulary

*Boldface vocabulary words also appear in a pre-made lesson for this title on VocabularyA–Z.com.

- **Content words:**
  Story critical: ***explore*** *(v.),* ***instruments*** *(n.),* ***mission*** *(n.),* ***orbits*** *(n.),* ***probes*** *(n.),* ***solar system*** *(n.)*
  Enrichment: ***gravity*** *(n.),* ***interstellar*** *(adj.),* ***plasma*** *(n.)*

Before Reading

Build Background

- Ask students to draw a picture of a spaceship. Have them turn the page over and write as many words as they can that relate to space and spaceships. Invite volunteers to share their picture with the class along with the key words they wrote. Write this information on the board.

- Have students share with a partner what they know about outer space. Place on the board photographs of astronomical objects, such as stars and planets. Have students identify the photographs. Discuss these images with students and how scientists learn more about items in space.

Preview the Book

Introduce the Book

- Give students their copy of the book. Guide them to the front and back covers and read the title. Have students discuss what they see on the covers. Encourage them to offer ideas as to what type of book it is (genre, text type, and so on) and what it might be about.
- Show students the title page. Discuss the information on the page (title of book, author's name).

Introduce the Reading Strategy: Ask and answer questions

- Explain to students that effective readers help themselves to understand what they are reading by asking questions before and during reading. Discuss with students how seeking answers to their questions will help them understand and remember what they read.
- Direct students to the table of contents. Model how to ask questions.
  Think-aloud: *The table of contents provides clues about the information in the book. Reading the section titles leads me to think of questions for this book: What kind of job will the spacecraft have? Are there people on the ship who have to do the work? I will search for the answers to these questions as I read.*
- Record your questions from the think-aloud on the board. Remind students that they will form questions using the information in the text and their own prior knowledge of the subject.
- Have students review the table of contents and write questions of their own on a separate sheet of paper. Invite volunteers to share their questions with the rest of the class, and record them on the board. Ask students to work with a partner to make predictions about the answers to these questions.
- As students read, encourage them to use other reading strategies in addition to the targeted strategy presented in this section.

Introduce the Comprehension Skill: Fact or opinion

- Explain to students that nonfiction books usually contain both facts and opinions. A fact is a detail that can be verified or proven, and an opinion expresses how a person feels. *Explain to students that it is necessary to distinguish between facts and opinions so they are not misled by emotion and personal feeling.*
- Point out that a reader can agree or disagree with an opinion. A fact can be proven by outside sources, such as scientific research or historic accounts.
- Write the following sentences on the board: *Jupiter is a planet in our solar system. Jupiter is the best planet in our solar system.*
- Model distinguishing between fact and opinion.
  Think-aloud: *When I read the first sentence, I ask myself, is this a fact or an opinion? I can look up this information in scientific journals and discover proof that Jupiter is a planet. Therefore, I know it is a fact. What about the second sentence? Some people may think Jupiter is the best planet, but some may disagree. This is not something that can be verified with research, because it expresses a preference. The second sentence must be an opinion.*
- Write the following fact on the board: *The* Voyagers' *mission was to explore Jupiter and Saturn.* Have students discuss with a partner how they can take this fact and transform it into an opinion. *(The mission was the most difficult one ever. The* Voyagers' *mission sounds frightening to me.)* Invite students to share their opinion with the rest of the class. Discuss with students how adding superlatives or emotional words creates opinions.

- Write the following opinion on the board: *Jupiter is a strange and frightening planet.* Read it aloud with students. Ask students to explain to a partner why this sentence is an opinion. Have students share with their partner any facts they know related to this opinion. Invite volunteers to share their fact with the rest of the class, and have other students give a thumbs-up signal if they agree that the statement is a fact, not an opinion.

Introduce the Vocabulary

- Remind students of the strategies they can use to sound out words they don't know. For example, they can use what they know about letter and sound correspondence to figure out the word. They can look for words within words, and prefixes and suffixes. For example, point to the word *explore* on page 4 and say: *I can use decoding strategies to figure out this word. First, I see the word begins with a prefix I recognize, the prefix* ex-*. That leaves the second part of the word, and I use the VCe pattern to sound out the long /o/ sound. The word begins with the /ex/ sound, ends with the /ore/ sound, and has to do with a spaceship's mission. What do spaceships do in space? They explore new regions.* Explore *has the right phonemes and prefix, and the sentence makes sense with this word. The word must be* explore.
- Introduce the story-critical vocabulary words listed in the vocabulary section of this lesson and write each one on the board. Place a corresponding photograph beneath the recorded word. Have students share with a partner a definition for the word on the basis of the photographs. Invite volunteers to share their definitions with the class.. Discuss with students the definition for each word.
- Turn to the glossary on page 16. Read the words and discuss their meanings aloud.
- Have students write the words on a separate sheet of paper. Ask students to draw their own picture for each word and write a sentence that accurately uses the vocabulary word. Invite volunteers to share one of their pictures and sentences with the rest of the class.

Set the Purpose

- Have students read to find out more about the *Voyager* spacecraft. Encourage students to ask and answer questions while reading.

During Reading

Student Reading

- **Guide the reading:** Have students read from page 4 to the end of page 7. Encourage those who finish early to go back and reread. Ask students to review the questions they wrote earlier and see if this part of the book answered their question(s).
- Model asking and answering questions.
  Think-aloud: *Earlier, I wanted to know what job the* Voyagers *had to do and whether any people would be involved. Now that I have read the beginning of the book, I can answer the first question. The* Voyagers' *job was to fly past Jupiter and Saturn and collect information. As for the second question, whether people would be doing the work, the book has not answered that yet. The book hasn't described any astronauts on the ships. I would guess these spacecraft are automatic, since they are traveling so far away that no person would be able to return to Earth. However, I will keep reading to see if the book explains more fully. I will also keep reading to look for answers to new questions I have: What did the* Voyagers *discover about Jupiter and Saturn? What messages are they sending back to us now?*
- Record the new questions on the board, and write the answer you found beneath the corresponding question. Review the other questions on the board with students. Have students point to a questions that the book answered. Invite volunteers to share with the class the answer they discovered. Record the answers on the board, and underline key words.
- Have students share with a partner questions they thought of as they read new information in the book, and have students write these questions on their separate sheet of paper. Ask the pairs to make predictions about the answers to those questions. Invite volunteers to share their questions with the rest of the class, and record them on the board, underlining key words.

- Write the following sentences from the book on the board: *Scientists guessed that the* Voyagers *would only last for about five years in space. More than thirty-five years later, the twin spacecraft are still sending information back to Earth.* Have students discuss with a partner which of these sentences shares an opinion and which one states a fact. Ask students to point to the fact on the board, and invite a volunteer to come and underline it. Discuss with students how they could verify the information in the sentence (check the records to prove the date the *Voyagers* were launched and that they are still sending information back).
- Discuss with students the reason the first sentence is an opinion (it expresses what the scientists guessed, their thoughts). Point out to students that facts frequently involve objective information such as dates and numbers, and opinions often represent emotions or thoughts. Opinions frequently use superlative words such as *best, worst, most,* and so on.
- **Check for understanding:** Have students read pages 8 through 12. Have them write new questions on their separate sheet of paper. Invite students to share the information they learned and the questions they generated as they read this section of the book.
- Have students review pages 9 through 12. Ask students share with a partner three facts they learned about Jupiter, Saturn, Uranus, or Neptune. Invite a volunteer to share a fact with the rest of the class. Have other students give a thumbs-up signal if they agree the detail is a fact.
- Have students work with their partner to think of opinions about the four planets. Call on random students to share their opinion with the rest of the class, and record opinions on the board. Point out to students that there often are more opinions than facts, because opinions represent how individual people feel or think, and facts are limited to what can be proven by the consensus of many people.
- Have students read the remainder of the book. Remind them to look for answers to their questions, and encourage them to add new questions they might have to their separate sheet of paper.

  Have students make a question mark in their book beside any word they do not understand or cannot pronounce. Encourage them to use the strategies they have learned to read each word and figure out its meaning.

After Reading

- Ask students what words, if any, they marked in their book. Use this opportunity to model how they can read these words using decoding strategies and context clues.

Reflect on the Reading Strategy

- **Think-aloud:** *I wanted to know about the discoveries the* Voyagers *made, and the book gave me a lot of information on the topic. I learned that thanks to the* Voyagers*, we know the Great Red Spot on Jupiter is a spinning storm. We now know Jupiter has a ring around it and that there are ice sheets and volcanoes on some of its moons. The book also described new rings found around Saturn and that Titan, one of Saturn's moons, has an atmosphere. What's more, the* Voyagers *learned about Neptune and Uranus as well. The* Voyagers *made many significant discoveries! My other question was about the messages that are being sent back to Earth now. The book informed me that the* Voyagers *have entered deep space, but it didn't describe what kind of messages the spacecraft are currently sending back. I will need to look elsewhere to find the answer to that question. Even though the book didn't answer every single question I had, searching for answers to my questions kept my attention focused on the book and helped me remember and understand what I read.*
- Record your answer on the board beneath the corresponding question. Review the remaining questions on the board, and invite volunteers to share with the class answers the book provided.
- Ask students to review the questions they wrote on a separate sheet of paper. Have students discuss with a partner all the questions they had before and during reading, and the answers they found. Invite volunteers to share their questions and answers with the rest of the class.

- Invite volunteers to come to the board and circle questions that remain unanswered, and have students circle any unanswered questions on their separate sheet of paper. Remind students that the book never fully explained about people on board the *Voyagers* or the messages currently sent by the spacecraft. Point out to students that books may not answer every question. Discuss with students resources they could use to find answers outside of the book, such as encyclopedias, articles, and other books.

Reflect on the Comprehension Skill

- **Discussion:** Have students discuss with a partner the facts they learned while reading. Call on random students to share a fact with the rest of the class and record facts on the board. Have students work with a partner to create opinions concerning those facts. Invite volunteers to share their opinions with the rest of the class.
- Discuss with students opinions that are expressed in the book (for example, the scientist's words on page 15, the descriptions of planets as strange or surprising, and so on). Invite volunteers to share how they know these details are opinions.
- Have students share with a partner how they can distinguish between fact and opinion. Invite volunteers to share their ideas with the rest of the class. Discuss with the class why it is important to recognize the difference between these two types of details.
- **Independent practice:** Introduce, explain, and have students complete the fact-or-opinion worksheet. If time allows, discuss their answers.
- **Enduring understanding:** In this book, you learned about the *Voyagers* spacecraft and their mission. Why do you think the trips of these spacecraft have been so important? What discoveries might the *Voyagers* make in deep space?

Build Skills

Grammar and Mechanics: Past-tense verbs

- Remind students that verbs are words that show action. Have students turn to page 8, and ask them to point to a verb. Invite a volunteer to share a verb with the rest of the class, and record all examples on the board *(was, carried, using, collected, changed).*
- Have students discuss with a partner whether the action described by these verbs is happening in the present or the past. Explain to students that *past-tense verbs* are words describing *actions that happened in the past.* Point out that *using* does not describe action in the past, and erase the verb from the list.
- Cover the *-ed* ending on the words *collected* and *changed,* and ask students to read the words aloud. Point out that these are the present-tense forms of the words, which describe action happening in the present. Explain to students that most verbs are changed to the past tense by adding the suffix *-ed* to the end of the words.
- Point out the word *changed.* Explain to students that when a verb ends in the letter *e,* they just add the suffix *-d* to the end of the word. Invite a volunteer to explain the reason for this rule (the word already has an *e* at the end).
- Ask students if they know the present-tense form of *carried (carry).* Explain to students that when the verb ends in the letter *y,* they change the *y* to an *i* before adding the suffix *-ed.* Have students work with a partner to practice this change, by putting the verbs *hurry* and *study* into their past-tense forms. Invite volunteers to come to the board and write the past-tense verb, and have other students give a thumbs-up signal if they agree with the spelling.
- Write the following words on the board and have students copy them on a separate sheet of paper: *explore, kick, head, cry, arrive,* and *reply.* Draw on the board a chart with three columns. Label the first column *regular,* the second column *ends in e,* and the third column *ends in y.* Have students work with a partner to sort the present-tense verbs into the appropriate column. Then, have students think about how to change each type of verb to its past-tense form.

.• Ask students to copy the words on a separate sheet of paper and work with a partner to change the verbs to past tense. Remind them to check whether the verbs end in the letter *e* or *y,* and modify the ending as necessary. Invite volunteers to come to the board and change the word to its past-tense form.

- Ask students to review the past-tense verbs on page 8 and identify the one that does not follow the rule of adding the suffix *-ed.* Explain to students that *was* is an irregular verb. Explain to students that some verbs take an entirely different form when they change from present to past tense. Point out that *was* is the past-tense form of the word *is.* Explain to students that they will memorize these irregular verbs as they read, and they should recognize them as verbs even if their endings are unfamiliar, because they still describe actions.

  Check for understanding: Pass out highlighters. Have students find and highlight every past-tense verb in the book. Point out that some verbs in the book are in the present tense, so students need to look at the word endings and the context of the sentences to determine whether the words are in the past or present tense. Call on random students to share with the class a past-tense verb and the page where it was located. Write the word on the board, and have students share with a partner the present-tense form of the verb. Have students work in groups to discuss whether the word has an added *-ed* suffix, an added *-d* suffix, or changed the *y* to an *i* before adding *-ed.* Discuss with students any irregular verbs they found.
- **Independent practice:** Introduce, explain, and have students complete the past-tense-verbs worksheet. If time allows, discuss their answers aloud.

Word Work: Open compound words

- Write the term *solar system* on the board and read it aloud with students. Ask students to identify the two different words that create *solar system.* Have them call out the words.
- Review or explain to students that *compound words* are formed when *two words are combined to make a new one.* The new word has its own definition, but the meaning of the word is usually influenced by the two words that form the compound. Invite volunteers to share the definitions for the words *solar* and *system,* and write them on the board. Have students discuss with a partner their thoughts on the meaning of the word *solar system.*
- Explain to students that since *solar* means relating to the Sun, and a *system* means a group of objects that work together, it makes sense that *solar system* means a group of objects working together with the Sun; in other words, planets orbiting the Sun.
- Remind students that many compound words are closed compounds—there is no space between the words. Explain to students that open compound words still combine two words to create a new one, but the two words remain separated with a space. Explain to students that the two words next to each other still have a separate meaning from each word on its own, which is why they create an open compound word.
- Have students turn to page 8 and point to a different compound word. Remind students that compound words are new words formed by the combination of two other words. Have students call out the compound word *(spacecraft).* Discuss with students the difference between this word and *solar system.* Ask students to identify if *spacecraft* is an open or closed compound word *(closed).* Discuss with students the meaning of the word *spacecraft,* using its two component words.
- Have students find and point to the term *magnetic field* on page 11. Have students identify the two words that create the compound word *magnetic field.* Discuss with students the meaning of the words *magnetic* and *field.* Have students work with a partner to determine the definition of *magnetic field,* on the basis of the other two definitions. Have students share with a partner whether *magnetic field* is an open or closed compound word.

- **Check for understanding:** Write the following compound words on the board: *goodbye, peanut butter, eggshell, wheelchair, bus driver, raincoat,* and *ice cream.* Have students work with a partner to separate the compound words into two smaller words and to use those words to determine a definition for the compound word. Invite volunteers to come to the board and underline the smaller words in each compound and to share a definition for the word. Then, point to each word, and have students call out whether it is a closed or open compound word.
- **Independent practice:** Introduce, explain, and have students complete the compound words worksheet. Discuss their answers aloud, and focus on whether each word is an open or closed compound word.

Build Fluency

Independent Reading

- Allow students to read their book independently. Additionally, partners can take turns reading parts of the book to each other.

Home Connection

- Give students their book to take home to read with parents, caregivers, siblings, or friends. Have students demonstrate how a reader asks questions then seeks answers while reading.

Extend the Reading

Informational Writing and Art Connection

Have students draw a picture of an astronomical object that interests them, such as comets, a planet, stars, black holes, and so on. Provide resource materials on outer space, such as other nonfiction books, magazines, and Internet articles. Guide students in researching their topic, and provide a graphic organizer for them to record facts they learn. Have students use that information to write three paragraphs that describe the subject of their picture and its relationship to Earth. Invite volunteers to share their pictures with the rest of the class and read their paragraphs aloud.

Visit WritingA–Z.com for a lesson and leveled materials on informational writing.

Science Connection

Divide students into groups and assign each group a planet. Provide picture books and beginning chapter books on the Solar System. Have groups study their planet, using the provided books and the book from this lesson. Have students then pretend they are interstellar travel agents, trying to convince people to travel to their planet. Pass out travel brochures for destinations around the world, and discuss with students how these brochures persuade people to visit other places. Ask groups to create a travel brochure for their planet that includes three facts and two opinions. Have each group present their information to the rest of the class, pretending the other students are clients looking to go on a trip into outer space. Have students draw and cut out paper replicas of each planet, using information they learned from the presentations and class discussions to draw the planets to proportionate size and similar appearance. Have students glue the planets on a piece of construction paper, placing them in the correct order away from the Sun. Share with students a mnemonic trick to help them memorize the order of the planets.

Skill Review

Discussion cards covering comprehension skills and strategies not explicitly taught with the book are provided as an extension activity. The following is a list of some ways these cards can be used with students:

- Use as discussion starters for literature circles.
- Have students choose one or more cards and write a response, either as an essay or as a journal entry.
- Distribute before reading the book and have students use one of the questions as a purpose for reading.
- Cut apart and use the cards as game cards with a board game.
- Conduct a class discussion as a review before the book quiz.

Assessment

Monitor students to determine if they can:

- consistently use the strategy of asking and answering questions to comprehend text during discussion
- accurately distinguish details as facts or opinions during discussion and on a worksheet
- correctly use past-tense verbs during discussion and on a worksheet
- accurately use open compound words during discussion and on a worksheet

Comprehension Checks

- Book Quiz
- Retelling Rubric