TEACHING LITERACY IN TENNESSEE: UNIT STARTER GRADE 3 ELA UNIT CONNECTED TO EARTH SCIENCE

Important Note: *The Unit Starter provides the foundation for English language arts unit planning in connection with Earth science. In addition to thoughtful preparation from these resources, there are additional components of the literacy block for which educators will need to plan and prepare. See page 6 for more guidance on planning for other components of the literacy block.*

TN Department of Education

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Note: A student packet with all daily tasks included can be accessed in a separate document entitled: "Grade 3 Student Packet."

Department of Education

GUIDANCE FOR EDUCATORS

1. WHY IS THE DEPARTMENT PROVIDING UNIT STARTERS?

The research is clear: Reading proficiently—especially reading proficiently early—prepares students for life-long success. To support greater reading proficiency among all students in Tennessee, Governor Haslam, the First Lady, and Commissioner McQueen kicked off the Read to be Ready campaign in February 2016 with a goal of having 75 percent of Tennessee third graders reading on grade level by 2025. Together, we are making progress. High-quality texts that meet grade-level expectations are increasingly making their way into classrooms. Students are spending more time reading, listening, and responding to texts that have the potential to build both skills-based and knowledge-based competencies. However, the first year of the initiative has revealed a need for strong resources to support the growing teacher expertise in Tennessee.

In May of 2017, the Tennessee Department of Education released Teaching Literacy in Tennessee. This document outlines the types of opportunities students need to become proficient readers, writers, and thinkers and includes a literacy unit design framework describing the ways that teachers can create these opportunities. This includes building rich learning opportunities around meaningful concepts within the English language arts block where students listen to, read, speak, and write about sets of texts that are worthy of students' time and attention.

The resources found in each of the Teaching Literacy in Tennessee: Unit Starters are intended to support planning for one full unit aligned to the vision for Teaching Literacy in Tennessee. They are intended to serve as a model to reference as educators continue to design units and compare the alignment of lessons to the vision for Teaching Literacy in Tennessee.

2. WHAT RESOURCES ARE INCLUDED IN A UNIT STARTER?

The Unit Starters include several of the key components in the framework for Teaching Literacy in Tennessee. These components serve as the foundation for strong unit planning and preparation.

Content Goals: Each Unit Starter begins with content goals that articulate the desired results for learners. [Adapted from McTighe, J. & Seif, E. (2011) and Wiggins, G. & McTighe, J. (2013)]

Universal Concept: A concept that bridges all disciplinary and grade-level boundaries. This concept provides educators and students with an organizational framework for connecting knowledge across disciplines into a coherent view of the world.

Universal Concept Example: Interdependence

Unit Concept: The unit concept is the application of the universal concept to one or more disciplines. This concept provides students with an organizational framework for connecting knowledge within the disciplines into a coherent view of the world and provides educators with a focus for unit planning.

Unit Concept Example: Interdependence of living things

Enduring Understandings and Essential Questions: Enduring understandings are the ideas we want students to understand, not just recall, from deep exploration of our unit concept; and essential questions are the corresponding open-ended questions that will guide students' exploration of these ideas. The enduring understandings reflect the abstract, easily misunderstood, "big" ideas of the discipline. They answer questions like "Why?" "So what?" and "How does this apply beyond the classroom?" to support deep levels of thinking. These questions spark genuine and relevant inquiry and provoke deep thought and lively discussion that will lead students to new understandings.

Enduring Understanding Example: People, plants, and animals depend on each other to survive.
Essential Question Example: Why do humans need to preserve trees?

Disciplinary Understandings and Guiding Questions: Disciplinary understandings are the specific ideas and specialized vocabulary of the discipline. These ideas will focus instruction, build disciplinary knowledge, and provide the schema to organize and anchor new words. Student understanding of these content-related ideas is critical to investigation and understanding of the more abstract and transferable ideas outlined in the enduring understandings. Guiding questions are open ended and guide students' exploration of the disciplinary understanding. These questions prompt ways of thinking and support knowledge building within the content areas.

Disciplinary Understanding Example: The structure of plants and the function of each part
Guiding Question Example: Why are roots important to plants?

The concepts for this set of Unit Starters were derived from the vertical progression of Tennessee's Life Science Standards and focus on plant and animal life. These standards are represented below. **Though strong connections are made to the science standards within the unit, it is critical to note that this Unit Starter does not encompass the totality of the identified science standards. The unit is not intended to replace instruction and hands-on application of the science standards and practices.**

Kindergarten

- K. ESS2.1: Analyze and interpret weather data (precipitation, wind, temperature, cloud cover) to describe patterns that occur over time (hourly, daily) using simple graphs, pictorial weather symbols, and tools (thermometer, rain gauge).
- K. ESS2.2: Develop and use models to predict weather and identify patterns in spring, summer, autumn, and winter
- K.ESS3.2: Explain the purpose of weather forecasting to prepare for, and respond to, severe weather in Tennessee.

Grade 1

- 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted.
- 1.ESS1.2: Observe natural objects in the sky that can be seen from Earth with the naked eye and recognize that a telescope, used as a tool, can provide greater detail of objects in the sky.
- 1.ESS1.3: Analyze data to predict patterns between sunrise and sunset, and the change of seasons.

Grade 2

- 2.ESS1.1: Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.

Grade 3

- 3.ESS1.1: Use data to categorize the planets in the solar system as inner or outer planets according to their physical properties.

Texts for Interactive Read Aloud & Shared Reading: Each Unit Starter includes a collection of complex texts to support strong interactive read aloud and shared reading experiences. These texts have been selected to provide regular opportunities for students to engage with rich academic language and build the disciplinary and enduring understandings for the unit. Given the complexity of these texts, teachers should revisit them with students after the initial read(s) to deepen knowledge. Multiple question sequences and tasks are included in the Unit Starter for

most texts; however, teachers are encouraged to add additional readings, questions, and tasks as needed to meet the needs of their students. Teachers may also analyze and select additional suitable texts to extend and/or support the development of the unit concepts. *See page 38 in* Teaching Literacy in Tennessee *for the three-part model for determining text complexity: quantitative dimensions of text complexity; qualitative dimensions of text complexity; and reader and task considerations.*

Suggested Resources for Small Group & Independent Reading: The Unit Starters include a list of suggested resources (texts, videos, online resources) to support a volume of reading on the unit concepts. These materials may be used during small group instruction and/or independent reading and writing activities to support knowledge building for students and to meet students' diverse learning needs. In addition, teachers are encouraged to select additional resources to extend and/or support the development of the unit concepts.

End-of-Unit Task: Each Unit Starter includes an end-of-unit task that provides an opportunity for students to demonstrate their understanding of the unit concept and to answer the essential questions for the unit in an authentic and meaningful context.

Daily Tasks & Question Sequences: Each Unit Starter includes a daily task and question sequence for approximately two weeks of instruction. The question sequences integrate the literacy standards to support students in accessing the complex texts during interactive read aloud and shared reading by drawing students' attention to complex features in the text and guiding students toward the disciplinary and/or enduring understandings of the unit.

The daily tasks provide an opportunity for students to demonstrate their new understandings by applying what they have learned from the texts they read daily across the literacy block. The texts and tasks have been carefully sequenced to support students in building disciplinary understandings over the course of the unit, so students are able to successfully engage in the end-of-unit task.

Sidebar Notes: As you navigate this document, you will also see that sidebar notes have been included throughout. These notes are intended to: 1) highlight additional rationale that may be of interest to educators; and 2) point out specific changes that have been made to the second iteration of Unit Starters based on feedback from the first set.

3. WHAT RESOURCES ARE NOT INCLUDED IN A UNIT STARTER?

These resources provide the foundation for unit planning but are not intended to be a comprehensive curriculum resource. Instead, educators must thoughtfully prepare from the resources that are included in the Unit Starter by adding additional resources as appropriate to meet instructional goals and student needs.

In addition, teachers will need to plan for other components of the English language arts block. The Unit Starters **do not include** the following:

- Instructional guidance for small group and independent reading and writing
    - Students should be grouped flexibly and resources selected to meet specific and unique needs of students, which may change over time.
- Instructional guidance and resources for explicit foundational skills instruction and foundational skills practice in and out of context
    - Reading foundational skills instruction should follow a year-long scope and sequence and be responsive to the unique needs of your students.

Please refer to Teaching Literacy in Tennessee for definitions of new or unfamiliar terms used in this document.

4. HOW SHOULD I USE THE RESOURCES IN THE UNIT STARTER TO PLAN MY UNIT?

Interactive Read Aloud and Shared Reading Experiences

To prepare for the unit, start by thoroughly reviewing the resources that are included in the Unit Starter. These resources are designed to support students in thinking deeply about the unit concepts and the enduring understandings embedded in complex text through interactive read aloud and shared reading experiences. To support this step, a unit preparation protocol and a lesson preparation protocol are included in Appendices A and B.

Small Group Reading and Writing

In addition to interactive read aloud and shared reading experiences, plan small group instruction to support the diverse needs of students in your classroom. Group students flexibly and select texts that address students' strengths (e.g., prior knowledge) and meet their specific needs:

Accuracy/word analysis: Some students may need additional practice with foundational reading skills that have already been taught and now are applied to reading authentic texts.

Fluency: Some students may be strong decoders but still struggle to read fluently, which holds them back from successful comprehension.

Comprehension: Some students may require support for their use of comprehension skills and strategies for building knowledge and acquiring academic vocabulary.

The Unit Starters include a list of suggested resources (texts, videos, online resources) that can be used to support small group instruction.

Modeled, Shared, and Interactive Writing

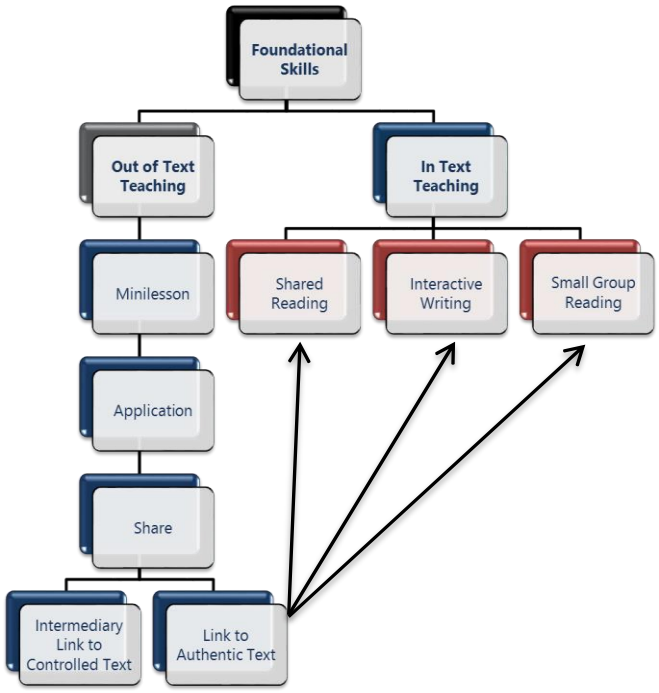
While important for a teacher to use modeled, shared, and interactive writing in order to support student independence with the tasks, please note that the units include few call-outs, if any, for modeled, shared, and interactive writing in the unit. To prepare students for success on the daily and end-of-unit tasks in the Unit Starter, teachers should plan for modeled, shared and interactive writing opportunities. Modeled writing is an instructional strategy where the teacher explicitly demonstrates the writing process for different forms and purposes. Shared writing is an instructional strategy where the teacher and students compose a text together with the teacher acting as the scribe. Interactive writing is an extension of shared writing in which the teacher and students compose a text together with the teacher strategically sharing the pen during the process.

Independent Reading and Writing

The Tennessee English Language Arts Standards call for students to read a range of literary and informational texts and to engage in a high volume of reading independently. The standards also call for students to have aligned writing experiences that develop their skills as writers and support their comprehension of rich, complex texts. Plan for how you will use the suggested resources to engage students in a variety of reading and writing experiences. Consider setting up systems for accountability during independent work time such as one-on-one conferences, center assignments, and/or accountable independent reading structures.

See pages 41-43 in Teaching Literacy in Tennessee for a description of these instructional strategies and their purpose within the literacy block.

Explicit Foundational Skills Instruction
It is recommended that educators consult the Foundational Literacy Standards and use a systematic phonics sequence (often found within a phonics program) for foundational skills instruction in conjunction with the resources in the Unit Starter. Strong foundational skills instruction follows an intentional, research-based progression of foundational skills that incorporates phonological awareness, phonics, and word recognition.



Foundational Skills Practice Out of Text and In Text
Strong foundational skills instruction includes opportunities for students to practice their newly acquired skills out of text and in text.

Out-of-text instruction may take the form of mini-lessons and hands-on application through activities, such as word sorts or the use of manipulatives.

In-text instruction provides opportunities across the literacy block for students to further apply their new learning in authentic reading and writing texts. Foundational skills assessments should be ongoing and should be used to determine when students have mastered the skill and are ready to move on to the next skill.

See pages 78-79 in Teaching Foundational Skills Through Reading and Writing Coach Training Manual *for more information about the relationship between out-of-text and in-text teaching.*

Structures for Academic Talk and Collaboration
The Unit Starters include suggestions for questions and daily tasks, but they do not include guidance on how to structure sharing/discussion time. Consider planning how your students will engage with you and each other when responding to complex text orally or in writing by incorporating things like expectations for talk time, sentence starters, hand signals, etc.

5. WHAT MATERIALS DO I NEED TO ORDER AND PRINT?

Texts for Interactive Read Aloud and Shared Reading
Each of the texts included in the Unit Starters can be purchased or accessed online or through a local library. A list of these texts is included in the Unit Starter materials. Educators will need to secure, purchase, or print one copy of each text selected to support interactive read aloud experiences. Each student will need a copy of the selected text for the shared reading experiences, unless the text is projected or displayed large enough for all students to read.

Suggested Texts for Small Group and Independent Reading
Additionally, each of the texts suggested for small group and independent reading can be purchased or accessed online or through a local library.

Materials to Be Printed
The Unit Starters can be accessed digitally here.

Educators may also consider printing:

- **Question Sequence –** Teachers may want to print question sequences or write the questions on sticky notes to have them available during interactive read aloud and shared reading experiences.
- **Daily Task –** Teachers may want to print the teacher directions for the daily task.
- **End-of-Unit Task –** Teachers may want to print the teacher directions for the end-of-unit task.

UNIT OVERVIEW

The diagram on the next page provides a high-level overview of the unit.

Guidance for the central text and suggested strategy for each day of instruction has been provided in the Unit Starter. It is important to note that this guidance does not reflect a comprehensive literacy block. Educators should support students in developing their expertise as readers and writers by flexibly utilizing a variety of instructional strategies throughout the literacy block.

Educators are also encouraged to use the guidance from this Unit Starter flexibly based on the needs, interests, and prior knowledge of students. For example, teachers may decide to re-read a text, pull in supplementary texts, or provide additional scaffolding based on their knowledge of their students. Teachers are encouraged to be strategic about how many instructional days to spend on this unit.

This Unit Starter is organized around three questions: (1) What are the desired results for learners? (2) How will students demonstrate these desired results? (3) What learning experiences will students need to achieve the desired results?

Department of Education

UNIT OVERVIEW

WHAT ARE THE DESIRED RESULTS FOR LEARNERS?

By the end of this unit, students will have developed an understanding of the following concepts and will be able to answer the following questions…

Universal Concept:
Systems

Unit Concept:
The Solar System

Enduring Understandings:
Earth's Place in the universe is in a unique solar system among other systems in a galaxy.

The **solar system** includes objects and bodies with observable physical properties and patterns of movement.

Essential Questions:
Where are we (Earth) in the universe? What else is in our solar system (besides Earth)?

Disciplinary Understandings:

The solar system is the Sun and the planets and other objects that orbit the Sun. (The position of the Sun makes the system solar.)

The force of gravity controls and affects objects and planets in the in our solar system.

The position of each planet (inner and outer) in the solar system relative to the Sun impacts the physical properties of the planet.

Our knowledge of the solar system and the universe has changed—and will continue to change—through observation and technologies (e.g., tools, instruments).

Guiding Questions: What makes the solar system "solar"? What "holds" the solar system together? Why do planets in the solar system look the way they do? How do we know what we know about the solar system (and the universe)? Have we always known these things?

HOW WILL STUDENTS DEMONSTRATE THESE DESIRED RESULTS?

Students will synthesize their learning from the unit texts and demonstrate understanding in the following authentic and meaningful context …
End-of-Unit Task:
Students, imagine you are a junior NASA (National Aeronautics and Space Administration) scientist that has been studying our solar system. The president has asked you if we can relocate people to other planets. Prepare a brief for the president on why Earth is ideally suited for life but the other planets are not.

Be sure to do the following when you write your brief:

- write an introduction;
- use information from unit texts to explain why earth is ideally suited for life;
- use information from unit texts to explain why each of the other planets in our solar system is not suitable for life. In your explanations, be sure to talk about the specific characteristics the planet has based on itsposition in relation to the sun;
- use linking words and phrases to connect your ideas;
- Use vocabulary words from our words of study: climate, patterns, distance, atmosphere, surface; and
- write a conclusion statement.

Pretend your classmates are presidential advisors whose job is to provide feedback on your brief before you send it to the president. When you are finished writing your brief, present it to the advisors. After they have provided you feedback, make necessary revisions to your brief before submitting.

When you are playing the role of the advisor, ask clarifying questions. Some possible questions are as follows:

- What might be some other key facts?
- How could you use the vocabulary words in your writing?
- What is your main message to the president?
- In what ways are you connecting your ideas together?

WHAT LEARNING EXPERIENCES WILL STUDENTS NEED TO ACHIEVE THE DESIRED RESULTS?

Students will achieve the desired results as a result of deep exploration of complex texts through interactive read-aloud (IRA) and shared reading (SR) experiences

Pluto's Secret (IRA)

"Our Planet Earth" (SR)

And Then There Were Eight: Poems about Space (SR)

"The Sun, yellow dwarf star at the heart of the solar system" (SR)

"Gravity" (IRA)

"What is an Orbit?" (SR)

The Planets (SR)

Solar System Forecast (IRA)

Zathura (IRA, SR)

Galaxies, Galaxies (IRA)

UNIT CONTENT GOALS

This Unit Starter was created with several levels of conceptual understanding in mind. Each conceptual level serves an instructional purpose, ranging from a universal concept that bridges disciplinary boundaries to concrete disciplinary understandings that focus instruction around specific schema. The diagram below shows the conceptual levels and questions that were considered during the development of all of the Unit Starters. The diagram on the following page outlines the specific concepts and questions for this Third Grade Unit Starter.

Universal Concept: A concept that bridges all disciplinary and grade-level boundaries (i.e., super-superordinate concept). This concept provides students with an organizational framework for connecting knowledge across disciplines into a coherent view of the world. (Example: Interdependence)

Unit Concept: The application of the crosscutting concept to one or more disciplines (i.e., superordinate concept). This concept provides students with an organizational framework for connecting knowledge within the disciplines into a coherent view of the world and provides educators with a focus for unit planning. (Example: Interdependence of living things)

Enduring Understandings: The ideas we want students to understand, not just recall, from deep exploration of our unit concept. The enduring understandings reflect the abstract, easily misunderstood, "big" ideas of the discipline. They answer questions like "Why?" "So what?" and "How does this apply beyond the classroom?" to support deep levels of thinking. (Example: People, plants, and animals depend on each other to survive.)

Essential Questions: Open-ended questions that guide students' exploration of the enduring understandings or "big" ideas of the discipline. These questions spark genuine and relevant inquiry and provoke deep thought and lively discussion that will lead students to new understandings. (Example: Why do humans need to preserve trees?)

Disciplinary Understandings: The specific ideas and specialized vocabulary of the discipline. These ideas will focus instruction, build disciplinary knowledge, and provide the schema to organize and anchor new words. Student understanding of these key ideas is critical to investigation and understanding of the more abstract and transferable ideas outlined in the enduring understandings. (Example: The structure of plants and the function of each part)

Guiding Questions: Open-ended questions that guide students' exploration of the disciplinary understandings in the unit and refer specifically to the domain (e.g., ecosystems). These questions prompt ways of thinking and perceiving that are the province of the expert. (Example: Why are roots important to plants?)

UNIT CONTENT GOALS

The diagram below outlines the specific concepts and questions for the Third Grade Unit Starter.

Universal Concept:
Systems

Unit Concept:
The Solar System

Enduring Understanding Earth's Place in the universe is in a unique solar system among other systems in a galaxy.	**Enduring Understanding** The **solar system** includes objects and bodies with observable physical properties and patterns of movement.
Essential Question Where are we (Earth) in the universe?	**Essential Question** What else is in our solar system (besides Earth)?

Disciplinary Understanding The solar system is the Sun and the planets and other objects that orbit the Sun. (The position of the Sun makes the system	**Disciplinary Understanding** The force of gravity controls and affects objects and planets in the in our solar system.	**Disciplinary Understanding** The position of each planet (inner and outer) in the solar system relative to the Sun impacts the physical properties of the planet.	**Disciplinary Understanding** Our knowledge of the solar system and the universe has changed—and will continue to change—through observation and
Guiding Question What makes the solar system "solar"?	**Guiding Question** What "holds" the solar system together?	**Guiding Question** Why do planets in the solar system look the way they do?	**Guiding Question** How do we know what we know about the solar system (and the universe)? Have we always known these

3.ESS1.1. Use data to categorize the planets in the solar system as inner or outer planets according to their physical properties.

UNIT STANDARDS

The questions and tasks outlined in this Unit Starter are connected to the following Tennessee English Language Arts and Science Standards. As you will see later in the Unit Starter, the question sequences and tasks for each text integrate multiple literacy standards to support students in accessing the rich content contained in the texts.

ALIGNED STANDARDS: INFORMATIONAL TEXT
3.RI.KID.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as a basis for the answers.
3.RI.KID.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
3.RI.KID.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
3.RI.CS.4 Determine the meaning of words and phrases in a text relevant to a grade 3 topic or subject area.
3.RI.CS.5 Use text features to locate information relevant to a given topic efficiently.
3.RI.IKI.7 Use information gained from illustrations and the words in a text to demonstrate understanding of a text.
3.RI.RRTC.10 Read and comprehend stories and informational texts at the high end of the grades 2-3 text complexity band independently and proficiently.

ALIGNED STANDARDS: LITERATURE
3.RL.KID.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as a basis for the answers
3.RL.KID.2 Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.
3.RL.CS.4 Determine the meaning of words and phrases as they are used in a text, distinguishing literal from nonliteral language (e.g., feeling blue versus the color blue).
3.RL.CS.5 Refer to parts of stories, dramas, and poems, using terms such as chapter, scene, and stanza; describe how each successive part of a text builds on earlier sections.
3.RL.CS.6 Distinguish reader perspective from that of the narrator or the perspectives of the characters and identify the point of view of a text.
3.RL.IKI.7 Explain how illustrations in a text contribute to what is conveyed by the words.
3.RL.RRTC.10 Read and comprehend stories and poems at the high end of the grades 2-3 text complexity band independently and proficiently.

ALIGNED STANDARDS: WRITING

3.W.TTP.2 Write informative/explanatory texts to examine a topic and convey ideas and information. a. Introduce a topic. b. Group related information together, including illustrations when needed to provide clarity to the reader. c. Develop the topic with facts, definitions, and details. d. Provide a conclusion. e. Use linking words and phrases to connect ideas within categories of information. f. Use precise language to inform about or explain the topic. g. Apply language standards addressed in the Foundational Literacy standard

3.W.PDW.4 With guidance and support, produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade specific expectations for writing types are defined in standards 1-3 above.)

3.W.PDW.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1– 3 up to and including grade 3.)

3.W.RBPK.7 Conduct short research projects that build general knowledge about a topic

3.W.RBPK.8 Recall information from experiences or gather information from print and digital sources, with support; take brief notes on sources and sort evidence into provided categories.

3.W.RBPK.9 Include evidence from literary or informational texts, applying grade 3 standards for reading.

3.W.RW.10 Write routinely over extended time frames for a range of discipline-specific tasks, purposes, and audiences; promote writing fluency.

ALIGNED STANDARDS: SPEAKING & LISTENING

3.SL.CC.1 Prepare for collaborative discussions on 3rd grade level topics and texts; engage effectively with varied
partners, building on others' ideas and expressing their own ideas clearly.

3.SL.CC.2 Determine the main ideas and supporting details of a text presented in diverse media such as visual, quantitative, and oral formats.

3.SL.CC.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

3.SL.PKI.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

3.SL.PKI.5 Add audio or visual elements when appropriate to emphasize or enhance certain facts or details.

3.SL.PKI.6 Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

ALIGNED STANDARDS: SCIENCE
3.ESS1.1: Use data to categorize the planets in the solar system as inner or outer planets according to their physical properties.

TEXTS FOR INTERACTIVE READ ALOUD & SHARED READING

These texts have been selected to provide regular opportunities for students to engage with rich academic language and to build the disciplinary and enduring understandings for the unit. They have been vetted for quality and complexity to support strong interactive read aloud and shared reading experiences.

The texts selected for interactive read aloud are intended to build students' comprehension of vocabulary, rich characters, engaging plots, and deep concepts and ideas across a variety of genres. These texts will typically be 1-3 grade levels above what students can read on their own.

The texts selected for shared reading are intended to provide opportunities for students to practice newly acquired foundational skills, develop reading fluency, and build knowledge across a variety of genres. Shared reading texts should be appropriately complex text so that students can read with teacher guidance and support. Teachers will need to take the grade level and time of year into account when deciding if the shared reading texts are appropriate for their students. Teachers will also need to consider students' current abilities and the pace at which students need to grow to meet or exceed grade-level expectations by the end of the year. If the shared reading texts included in the Unit Starter are not appropriate for the specific group of students and time of year, educators are encouraged to make an informed decision about selecting a different text for shared reading. The shared reading texts in this Unit Starter are appropriate for instruction closer to the end of the academic school year. Later in the Unit Starter, you will see an example of different texts that may be more appropriate for different times of the year.

While preparing for instruction, educators are urged to carefully consider the needs and interests of the readers, including how to foster and sustain new interests, and to be strategic about the types of tasks that will support readers in deeply engaging with these rich texts. Teachers should also consider how they will make connections to students' prior knowledge and students' cultural and previous academic experiences. Teachers need to consider the vocabulary demands of the text and the level of support readers will need to deeply understand the text.

TITLE	AUTHOR
Pluto's Secret	David H. DeVorkin and Margaret A. Weitekamp
"Our Planet Earth"	Core Knowledge, Grade 3 Domain 7: Astronomy
And Then There Were Eight: Poems about Space	Laura Purdie Salas
"The Sun, Yellow Dwarf Star at the Heart of the Solar System"	NewsELA
"Gravity"	Core Knowledge, Grade 3 Domain 7: Astronomy 5A
"What is an Orbit?"	NewsELA
The Planets	Gail Gibbons
Solar System Forecast	Kelly Kizer Whitt
Zathura	Chris Van Allsburg
Galaxies, Galaxies	Gail Gibbons

SUGGESTED RESOURCES FOR SMALL GROUP & INDEPENDENT READING

These resources can be used to support a volume of reading on the unit concepts. These materials may be used during small group instruction and/or independent reading and writing activities to support knowledge building for students and to meet students' diverse learning needs.

TITLE (TEXTS, VIDEOS & ELECTRONIC RESOURCES)	AUTHOR
Destination Space	Seymour Simon
Journey Through Our Solar System	Mae Jemison
Here Comes the Sun	Crash Course Kids
Weather in Space (Rocky Planets)	Crash Course Kids
Gas Giants Weather	Crash Course Kids
Sun, Moon, and Stars	Stephanie Turnbill
National Geographic Little Kids First Big Book of Space	Catherine D. Hughes
Next Stop Neptune: Experiencing the Solar System	Alvin Jenkins
Discovery Spaceopedia: The Complete Guide to Everything Space	Discovery
Smart Kids Space: For Kids Who Really Love Space	Roger Priddy
Oxford First Book of Space	Andrew Langley
"What is a Planet?"	NASA.gov, adapted by Newsela
Space Songs	Myra Cohn Livingston
Comets, Stars, the Moon, and Mars: Space Poems and Paintings	Douglas Florian
The Planets in Our Solar System	Franklyn Branley
Our Solar System	Seymour Simon
I, Galileo	Bonnie Christensen

UNIT VOCABULARY

The following list contains vocabulary words from the interactive read aloud and shared reading texts that warrant instructional time and attention. Teachers should attend to these words **as they are encountered in the texts** to build students' vocabulary and to deepen their understanding of the unit concepts. Educators are encouraged to identify vocabulary that might be unfamiliar to students and to determine how they will teach those words (implicit, embedded, or explicit instruction) based on knowledge of their students. See Appendix C for an example routine for explicit vocabulary instruction.

Note: In addition to this comprehensive list, each question sequence lists the newly introduced vocabulary words that warrant instructional time and attention during the specific reading. These lists also provide guidance as to how the specific words could be taught.

Educators are also encouraged to dedicate a space in their classrooms to record unit vocabulary. This will provide a reference point for the students as they read, write, and talk about the unit topics. Through repeated attention to these words over the course of the unit, students will develop their understanding of these words and will begin to use them in speaking and writing activities.

Day 1	Day 2	Day 3	Day 4	Day 5
solar system universe orbits dwarf planet	wander eternal	current anchor gravity galaxy rotation/rotating	matter gravitational pull/gravitational force attraction momentum	designated atmosphere environment
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
dense surface	advisory forecast greenhouse effect appearance raging electrifying voyagers	meteor meteor shower polarity gravity belt gyroscope vessel evasive defective malfunctioning	none	technological advancements

TEXT
Text: *Pluto's Secret: An Icy World's Tale of Discovery*
Question Sequence: First Read
Instructional Strategy: Interactive Read Aloud

Note: In many cases, multiple question sequences are included for one text. These sequences intentionally build on each other in service of deepening students' analysis of the text and understanding of the unit's disciplinary and enduring understandings. Teachers may also decide to read the text in its entirety prior to asking questions.

Note: Each instructional strategy has a different purpose. Interactive read aloud is a time for students to actively listen and respond to above grade level complex text. The texts selected for interactive read aloud are intended to build students' comprehension of vocabulary, rich characters, engaging plots, and deep concepts and ideas across a variety of genres. These texts will typically be 1-3 grade levels above what students can read on their own. Shared reading is an interactive experience in which students join in the reading of an appropriately complex text with teacher support. Texts used for shared reading are texts that students can read with teacher support. The purpose of shared reading is to provide opportunities for students to practice their newly acquired foundational skills, develop reading fluency, and build knowledge. These texts should be chosen by considering students' current abilities and the pace at which they need to grow to end the year meeting or exceeding grade-level expectations.

TEXT COMPLEXITY ANALYSIS
QUANTITATIVE COMPLEXITY MEASURES
770L
QUALITATIVE COMPLEXITY MEASURES

TEXT STRUCTURE	LANGUAGE FEATURES
The text structure is moderately complex. The organization of the text is generally chronological, with picture support and labeling that enhances the reader's understanding of the placement of Pluto in the solar system.	The language features are moderately complex. The vocabulary is largely explicit throughout the text. The sentence structure supports both simple and more complex sentences, with opportunities to experience dialogue from the point of view of the planet Pluto.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose of the text is moderately complex. The purpose of the text is implied from the beginning of the text, but is easy to identify by the end of the text.	The knowledge demands for this text are moderately complex. The text relies on some discipline-specific content knowledge around the historical aspect of the classification of dwarf planets.

LESSON OBJECTIVE(S) FOR THIS READING

Note: The lesson objectives for each reading articulate the integrated understandings, including ELA, disciplinary, and enduring understandings, students will grasp and/or build on as a result of engaging with the text. The question sequence for each reading will draw students' attention to complex features of the text that will support or challenge students. Over the course of the unit, the learning objectives for each reading build intentionally on one another to provide a coherent learning experience for students. This coherence is also supported through the intentional sequence of texts.

Students will understand that classifying characteristics of a planet, and making observations of Pluto, helped scientists decide if Pluto was actually a planet.

In today's reading, students will:

- recount key details scientists learned about Pluto to determine its secret;
- discuss how Pluto's point of view through dialogue helped to reveal Pluto's secret;
- describe how successive parts of the text build towards revealing Pluto's secret; and
- write to explain how Pluto's secret helped change scientific thinking.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- solar system (embedded)
- universe (embedded)
- orbits (embedded)
- dwarf planet (embedded)

DAILY TASK

Note: The daily tasks build over the course of the unit to support students in developing the knowledge, vocabulary, and skills they will need in order to complete the end-of-unit task. Expectations for students' performance on the daily tasks are aligned with the disciplinary standards and the grade-level literacy standards for writing and speaking & listening.

What was Pluto's secret? How did this change impact scientific thinking? Write a paragraph using text evidence to explain your thinking. In your writing, be sure to:

- write an introduction;
- use information from the text to describe Pluto's secret;
- use information from the text to describe how this change impacted scientific thinking;
- use linking words and phrases to connect your ideas;
- use vocabulary words from the text to explain your thinking; and
- write a conclusion statement.

POSSIBLE STUDENT RESPONSE

Note: Tasks throughout the unit are considered to be independent and autonomous writing opportunities where students express their learning through their own writing. Teachers are encouraged to integrate strategies, such as modeled, shared, and interactive writing, in order to equip students with the skills and strategies needed to complete the tasks. The use of these other writing strategies should not demonstrate a carbon copy of the task before students complete it. It is important for students to capture their own thinking as they complete each task.

For a long time, no one on Earth could see Pluto because it was too far away from our planet, and it also was not bright enough to be viewed in the night sky. When scientists finally found what we know as Pluto, they named it Planet X. But Pluto had a secret that was not discovered until many years later. Pluto's secret was the planet was actually a dwarf planet because it orbits, or circles the sun with other icy planets. In addition, there are other bands of icy worlds around other stars all over the universe. Pluto also helped astronomers define what a planet is and is not. Pluto changed scientific thinking because scientists now have a way to determine if they are observing a planet or a dwarf planet. To be considered a planet, you must observe: the planet orbiting the sun, the planet must be round in shape, and each planet has to be alone in its orbit. Pluto orbits with other planets around the sun in Kuiper's Belt, so scientists had to change their thinking given this new information. When scientists discover new information, we can learn new things about our universe because we have evidence to back up the change in thinking.

Note: You will not see one specific skill indicated as the focus for the reading. Educators are encouraged to support students in arriving at the objectives for the reading by integrating multiple literacy standards. To that end, the question sequences integrate multiple literacy standards. The literacy standards will come into play as students access the rich texts included in the Unit Starter. In this way, multiple literacy standards naturally support students in accessing and making meaning of the text.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 5	Based on the text evidence, why didn't anyone on Earth figure out that Pluto had a secret?	For a long time no one of Earth could see Pluto because it was too far away and not bright enough to be seen in the sky.
Pages 12-13	What new clues surfaced when Clyde Tombaugh started looking in the night sky?	Clyde Tombaugh noticed that Planet X was in a different place among the stars when he used the telescopic camera.
Page 16	Why was Pluto named the "Roman god of the dark underworld"? Use specific text evidence to explain your thinking.	Pluto is named the Roman god of the dark underworld because it is so far away from the sun that it must be a cold, dark place too.
Pages 18-19	Which phrases explain the differences in orbits? How do the illustrations help you understand the difference?	Other planets have flat orbits around the sun, but Pluto has an orbit that "tips up like a slide on a playground". I can see in the illustration that Pluto's orbit looks different from other orbits.
Page 21	Pluto is talking in this story. How is this helping you understand that Pluto has a secret? What do you think his secret is?  (This is an opportunity for a collaborative talk structure.)	Pluto speaking is helping me to see that he is telling the astronomers they "have not figured him out yet". They are confused because Pluto is doing things that planets aren't supposed to do like switch places with other planets. I think Pluto's secret is that he is a special kind of planet.

Page 25	What criteria helped scientists know by the new definition that Pluto was no longer considered a full-sized planet?	While Pluto orbits the sun and is a round shape, it is not alone in its orbit.
Pages 30-31	Let's think back to earlier parts of this story. What information did the author provide through text and dialogue that helped us learn Pluto's secret? What was Pluto's Secret? Explain your answer using details from our text.  How were scientists able to figure out Pluto's secret? What did the author do to interest you in the story?	There were places in the story where Pluto would speak and tell the astronomers that he really could do things like have a different orbit and switch places with other planets. He also told the astronomers that he wasn't alone. Pluto's secret is that he is actually a dwarf planet because he orbits with other icy planets. In addition, there are other bands of icy worlds around other stars all over the universe. Scientists were able to discover Pluto's secret by observing the sky with newer, more powerful telescopes. The author got me interested in the story by creating suspense. Pluto knew something that the astronomers didn't know, and I wanted to keep reading to figure out what it was.

OUR PLANET EARTH – READING 1, QUESTION SEQUENCE 1, DAILY TASK 2

TEXT
Text: "Our Planet Earth" 1A-1 through 1A-4 from the Core Knowledge Language Arts Curriculum, Grade 3 Domain 7: Astronomy This text is paired with the poem, "Just Right" from, *And Then There Were Eight: Poems about Space.* **Question Sequence:** First Read **Instructional Strategy:** Shared Reading

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
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QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is slightly complex. This informational text makes explicit connections between ideas, is chronological, and easy to predict. Text features such as bullets, footnotes, and photographs support readers understanding of written text.	The language features are moderately complex. The vocabulary in this text is largely explicit, and many words are defined in the text. The text is written in using conversational language. There is a mixture of simple and complex sentences.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose of the text is slightly complex; it conveys overview information about Earth.	The knowledge demands for this text are very complex due to moderate levels of discipline-specific or theoretical knowledge. It includes concrete ideas as well as challenging abstract ideas such as the sun being 93 million miles away. There is an allusion to the story of Goldilocks and things being "just right".

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand that the sun is the perfect distance from Earth to sustain life. Students will also build on their understanding of the characteristics of a planet.

In today's reading, students will:

- compare and contrast learning from this text and the previous text on characteristics of planets;
- explain how details about Earth's distance from the sun make it just right to sustain life; and
- write to summarize the importance of the Earth's distance from the sun.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- wander (embedded)
- eternal (explicit)

The following words will be reinforced in this reading.

- universe
- astronomers

DAILY TASK

In your journal, write a letter to the extraterrestrial being explaining why Earth is just the right distance from the sun. Using evidence from both texts and precise language, summarize what you have learned about the importance of the sun and its distance from Earth. In your writing, be sure to:

- introduce your topic;
- develop the topic with facts, definitions, and details;
- group related information together;
- use illustrations when needed;
- use linking words and phrases; and
- end with a concluding statement.

Optional: Share your written response with a partner. Partners should provide feedback about content in the letter.

Teacher's Note: This task is meant to be completed after the reading of Our Planet Earth *(IRA) and* "Just Right" *Pg. 19 in* And Then There Were Eight: Poems about Space *(SR) today.*

POSSIBLE STUDENT RESPONSE
Dear ET, I live on planet Earth. Earth is a planet because it wanders, or travels in an orbit around our sun. Earth is just the right distance from our sun for life to exist, or occur. Living things on Earth need the light and warmth from the sun. If the earth was any closer to the sun, all the water would boil, but if it was farther away, the water on Earth would freeze. Living things need water to survive. Ninety-three million miles from the sun is the perfect distance to keep it not too hot or too cold on Earth. We need our sun because if we didn't have it, we would have eternal night, meaning it would be night forever. The temperature on Earth allows life to exist, or occur. Do you live on a planet? How far away is it from your sun? Your friend, Earthling

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
"Our Planet Earth"	I notice text headings. Explain why authors include headings.	Authors use headings to help the reader figure out what that paragraph is about. It groups ideas just like a good reader does.
Page 24	Ancient Romans decided to use the word "planet" which means wanderer. Explain why the Romans chose that name. Knowing about orbits from your previous learning, what does wanderer mean?  (This is an opportunity for a collaborative talk structure.)	The Romans chose the word "planet" because the objects they saw in the sky looked like they moved around on a different path than stars. Because the planets didn't follow the same path as stars, it must have seemed as though they were moving around with a set and same place to go. Wanderer must mean to travel or move around.
Page 25 Top of the page	Scientists set out rules or characteristics of planets. What are the characteristics of planets? In *Pluto's Secret* we learned some of these. What new learning are we gaining from this text?	1. A planet is a sphere or nearly round. 2. A planet orbits a star. 3. A planet has a clear path in its orbit. 4. A planet is made of rocks or gas. 5. A planet reflects light but doesn't make light. In Pluto's Secret we learned that a planet has to be alone, but in this text it said the planet has to have a clear path. I think that means the same thing. The other new learning is that planets have to be made of rocks or gas and they reflect light instead of make it.

	Explain why you think the scientists agreed on this list. How did this help them make a decision about Pluto in *Pluto's Secret*?	Scientists realized not all objects in the sky are the same. By deciding and agreeing on this list, they could all agree if a planet was really a planet. This helped them all agree if Pluto was a planet or not.
Page 25 Section 1A-3	Why is the sun not classified as a planet? Why does the author describe sun's energy as being like the temperature of Goldilocks' porridge?	The sun does not orbit around a star; the sun makes its own light. Goldilocks is a story about a girl that was searching for porridge, or soup that wasn't too hot or too cold for her to eat. The author uses this analogy so we can understand that the sun's temperature is not too hot, or too cold.
Page 26 Section 1A-4	What does the author want you to know about Earth's atmosphere? Use text evidence to explain how you know.	The author wants me to know that the atmosphere is important for the survival of livings things. The authors says that the atmosphere helps keep the earth the right temperature. He also says that the atmosphere protects the earth.

*And Then There Were Eight: Poems about Space, "*Just Right*" Pg. 19* – READING 1, QUESTION SEQUENCE 1, DAILY TASK 2

TEXT
Text: *And Then There Were Eight: Poems about Space:* "Just Right" Pg. 19 This poem is paired with the text, **"**Our Planet Earth" 1A-1 through 1A-3 from the Core Knowledge Language Arts Curriculum, Grade 3 Domain 7: Astronomy **Question Sequence:** First Read **Instructional Strategy:** Shared Reading

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
NP- Non Prose	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The poem's structure is slightly complex. The stanzas are organized in a chronologically in sentences.	The language features are slightly complex. Vocabulary should be familiar to understand. It's a straightforward poem that's easy to understand.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The levels of meaning and purpose of the text are slightly complex. It's a simple poem about needing the sun.	The knowledge demands of the poem are slightly complex. Students should have background knowledge from previous grades about needing the sun.

VOCABULARY WORDS
The following words are introduced during the reading. Suggested instructional methods are included in parentheses. • eternal (embedded)

LESSON OBJECTIVES(S) FOR THIS READING

Students will understand that the sun is the perfect distance from Earth to sustain life.

In today's reading, students will:

- make connections between 2 texts about how the sun enables our planet to sustain life;
- determine that the authors of both texts are writing to inform about the importance of the sun; and
- write to summarize the importance of the Earth's distance from the sun.

DAILY TASK

In your journal, write a letter to the extraterrestrial being explaining why Earth is just the right distance from our sun. Using evidence from both texts and using precise language, summarize what you have learned about the importance of the sun and its distance from Earth. In your writing, be sure to:

- introduce your topic;
- develop the topic with facts, definitions, and details;
- group related information together;
- use illustrations when needed;
- use linking words and phrases; and
- end with a concluding statement.

Optional: Share your written response with a partner. Partners should provide feedback about content in the letter.

Teacher's Note: This task is meant to be completed after the reading of Our Planet Earth *(SR) and "Just Right" Pg. 19 from,* And Then There Were Eight: Poems about Space *(SR) today.*

POSSIBLE STUDENT RESPONSE

Dear ET,
I live on planet Earth. Earth is a planet because it wanders, or travels in an orbit around our sun. Earth is just the right distance from our sun for life to exist, or occur. Living things on Earth need the light and warmth from the sun. If the earth was any closer to the sun, all the water would boil, but if it was farther away, the water on Earth would freeze. Living things need water to survive. Ninety-three million miles from the sun is the perfect distance to keep it not too hot or too cold on Earth. We need our sun because if we didn't have it, we would have eternal night, meaning it would be night forever. The temperature on Earth allows life to exist, or occur. Do you live on a planet? How far away is it from your sun?
Your friend,
Earthling

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
	I noticed this poet divided the poem into two sections or paragraphs. What do we call a paragraph in a poem, and why would this help poetry readers?	In a poem, a paragraph is called a stanza, and it helps us group ideas just like in a story.
	After reading the poem, "Just Right," explain what would happen if the earth was closer to the sun. What would happen if the earth was farther away from the sun? Thinking about this poem and our previous text, why are conditions on Earth "just right" for humans, animals, and plants to live? Be sure to include how the earth's distance from the sun affects the planet.  (This is an opportunity for a collaborative talk structure.)	If the earth was closer to the sun, it would be too hot and all the water on earth would boil away. If the earth was farther from the sun, it would be too cold and all the water on earth would freeze. Humans need water, light, and certain temperatures to live. The earth is just right for humans, because it is the perfect temperature. The earth's distance from the sun keeps the earth from being too hot or too cold. Earth's temperature is "Just Right."
	What does the author mean by "eternal night"? Why would this be bad for living things?	Eternal night means that if the sun were further away, we wouldn't have daylight. Livings things can't survive without light from the sun.
	Let's think back to our text, *Our Planet Earth*, what information did we learn in that text that helps us understand why this poem is titled "Just Right"?	In part 13-A, we read that ninety-three million miles away is the perfect distance for life on Earth to exist. So ninety-three million miles is a "just right" distance for life on Earth.
	What is the main idea of both of these texts? How do you know? 	Both texts are helping us understand that the sun is the perfect distance from Earth, and that the sun enables livings things to have what they need to survive. I know because there are details about the sun's distance from Earth, and that the distance keeps our water sources from boiling and evaporating, or freezing.

TEXT
Text: "The Sun, Yellow Dwarf Star at the Heart of the Solar System" Lexile 740 *pages 2-3; stop after discussing the age of the sun https://newsela.com/read/lib-nasa-sun-overview/id/22005/ **Question Sequence:** First **Instructional Strategy:** Shared Reading

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
740 L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is moderately complex. The ideas are mostly explicit and clear; however, the text is not chronological or sequential. The text utilizes headings to help students organize information.	The language features are moderately complex. The text is largely explicit but has several opportunities for more complex meaning such as comparing the sun to an anchor and the use of million and billion for distance and size. This article is mostly comprised of simple sentences, although it does contain occasional complex sentences.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The meaning is moderately complex. This text's purpose is to help students understand that our sun is the center of our solar system and everything revolves around it. While the ideas are explicitly stated, the concept of space and vast distances in our galaxy are abstract.	The knowledge demands for this text are moderately complex. The text talks about the sun being responsible for Earth's seasons and weather. Students will have learned about those concepts in previous grades. Also, the text talks about the sun's gravity and ocean currents.

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand characteristics about the sun and that it's an important anchor for our solar system.

In today's reading, students will:

- use headings to locate information about the sun;
- explain points the author makes to describe the significance of the sun; and
- synthesize learning by writing a brief about the significance of the relationship between the sun and Earth.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- current (implicit)
- anchor (implicit)
- gravity (explicit)
- galaxy (implicit)
- rotation/rotating (embedded)

The following words will be reinforced in this reading.

- dwarf
- orbit

DAILY TASK

Graphic Organizer: (Pre-writing activity)

Student Directions: Fold your paper two times: once across and once from top to bottom so that it is divided into four sections. (vertically and horizontally) Next, write the answers to the questions in the appropriate section using evidence from the text.

- Square – List three things the sun causes on Earth.
- Triangle – What did you learn about the position of the sun in our solar system?
- Circle – What did you learn about the size and age of the sun?
- Rectangle –Explain why the sun is important.

Teacher Directions/Guidance: Students should discuss their answers with one or more classmates. Provide students time to edit their writing or add to their notes after discussing with a partner(s).

Writing Task:
In *Pluto's Secret*, scientists used new inventions and research to learn new facts about Pluto. Imagine you are a Jr. researcher studying the relationship between the sun and Earth. In your journal, write a brief to explain to other scientists the significance of the relationship between Earth and the sun.

- introduce the topic;
- develop the topic with facts, definitions, and details from the text and your graphic organizer;

- use linking words and phrases;
- use precise language to provide details about the topic;
- and provide a conclusion; and
- use the conventions of language correctly.

Teacher Note: A brief is a short report of information with a targeted audience and purpose. Support student understanding of this type of writing with teacher scaffolding and support.

POSSIBLE STUDENT RESPONSE

Graphic Organizer:

1. Square: The sun is responsible for Earth's seasons, ocean currents, and our weather.
2. Triangle: Our sun is part of the Milky Way galaxy and orbits the center of the galaxy. Our sun is the center of our solar system, and everything in it orbits the sun.
3. Circle: Scientists think the sun has been around for 4.5 billion years, but the sun will not last forever. The sun will start to die around 6.5 billion years from now. 1.3 million Earths could fit in the space of the sun because it's so large.
4. Rectangle: The sun provides heat and light for us to live. Because of gravity created by the sun, we don't fly off into the universe. This dwarf star acts like a big anchor!

Writing Task:

The sun is a dwarf star that is very important to us on Earth. The sun is almost 93 million miles away, but it still is responsible for our ocean currents, the weather, and Earth's seasons. More importantly, the sun provides gravity so we don't fly away in space! This star is so large, it would take 1.3 billion Earths to fill up the sun. The sun orbits in the center of the Milky Way Galaxy, and everything in our solar system orbits the sun. Even though the sun has been around for 4.5 billion years, we know it will likely die in about 6.5 billion years. This far away dwarf star is very important to our life on Earth.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 2	In *Pluto's Secret* we learned that Pluto is called a dwarf planet. Here we have read that the sun is a yellow dwarf. Why might it be called a dwarf?	Since Pluto is much smaller than other planets and called a dwarf, maybe the sun is smaller than other stars.
Page 3 (top of page)	Is Pluto smaller than the sun? What evidence from this text and *Pluto's Secret* help you to know this?	Pluto is WAY smaller than the sun. I know this because we learned Pluto is much smaller than Earth, and the Earth is so small, you could put 1.3 million Earths in the space of the sun.
	Explain how the sun impacts the Earth. Use information from our text in your response.  (This is an opportunity for a collaborative talk structure.)	The article tells us that the sun is the center of the solar system and Earth and other planets move around it. I think the author is telling us the sun is responsible for seasons, weather, and ocean currents because we are moving around

		the sun. If we didn't move around the sun, we wouldn't have those things on Earth.
	In the sentence, "Everything in the solar system orbits or moves around it, including Earth," what does orbit mean? What does this tell us about the sun's location?	The author says orbits, or moves around it. I think orbit must mean to move around. Because the planets move around the sun, the sun must be in the center of our solar system.
	The author refers to the sun as a "big anchor." Explain how the sun like an anchor. 	The sun is like an anchor because it creates gravity and pulls everything towards it and keeps the planets in orbit. Just like an anchor can hold things in place, like a boat, the sun holds us in place in the solar system, so we don't fly away.
Page 3 (Part of the Milky Way Galaxy)	How does the size of the sun compare to the size of the Milky Way galaxy? What details in the text tell you this? How did you know where to find this information?	There are at least 200 billion other stars and around 100 billion planets in the Milky Way. The text says it would take our sun around 230 million years to orbit the center of the Milky Way. I looked under the heading, "Part of the Milky Way".
Page 3 (The Sun is 4.5 Billion Years Old)	Will the sun exist forever? How do you know?	No, the text says the sun will live for around another 6.5 billion years.
	What will happen to the sun when it starts to die? How might this impact life on earth? 	When the sun starts to die, it will first grow very large and eat up, or consume, Mercury and Venus and possibly Earth. The sun provides heat and light that we need to live, it is very important that we have the sun.
After reading	Why is the article titled, "The Sun, Yellow Dwarf Star at the Heart of the Solar System?" Why did the author use the word heart?	The title shows us the importance of the sun in our solar system. Without the sun, people wouldn't be able to live on Earth. For life, a person's heart must work right. I think the author is making a connection between the importance of the sun to us on Earth and a person's heart to live.

ALTERNATIVE SHARED READING OPTIONS

630 L https://newsela.com/read/lib-nasa-sun-overview/id/22004/

1030 L https://newsela.com/read/lib-nasa-sun-overview/id/22003/

1170 L https://newsela.com/read/lib-nasa-sun-overview/id/22002/

Teacher's Note: Consider time of year and needs of students to determine appropriate Lexile level. The lesson was written using a Lexile of 740.

Note: The texts selected for shared reading are intended to provide opportunities for students to practice newly acquired foundational skills, to develop reading fluency, and to build knowledge across a variety of genres. Shared reading texts should be appropriately complex text that students can read with teacher guidance and support. Teachers will need to take grade-level and time of year into account when deciding if the shared reading texts are appropriate for their students. Teachers will also need to consider students' current abilities and the pace at which students need to grow to meet or exceed grade-level expectations by the end of the year. If the shared reading texts included in the Unit Starter are not appropriate for the specific group of students and time of year, educators are encouraged to make an informed decision about selecting a different text for shared reading. The shared reading texts with question sequences in this Unit Starter are appropriate for instruction closer to the end of the academic school year. However, as you see here, different texts may be more appropriate if this Unit Starter is used at a different point in the year.

TEXT
Text: *Gravity (5A1 – 5A8)* from Core Knowledge Language Arts Curriculum, Grade 3, Domain 7: Astronomy This reading will be pared with the article "What is an orbit?" **Question Sequence:** First Read **Instructional Strategy:** Interactive Read Aloud

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
850 L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is moderately complex. Connections between ideas are mostly explicit; however, the text is not chronological or easy to predict. The text contains headings for each section, and the graphics enhance the reader's understanding content.	The language features are moderately complex. The language is mostly explicit and easy to understand with some occasions for more complex meaning. The vocabulary is mostly contemporary and conversational with few Tier 3 words such as celestial and gravitational. The text has some simple sentences and complex constructions, but mostly compound sentences.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose is very complex. The purpose of the text is to introduce students to the concept of gravity and the larger role it plays in the universe. The concept of an invisible force pulling everything together is an abstract idea.	The knowledge demands of the text are moderately complex. Knowledge of gravity and its relationship to all the parts of our solar system are essential for students to understand the system. The text requires some common practical knowledge as well as discipline-specific content knowledge about force and weight. The text has a mix of simple and abstract ideas.

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LESSON OBJECTIVE(S) FOR *GRAVITY*

Students will understand that the force of gravity affects objects and planets in our solar system.
In today's reading, students will:

- describe the relationship between gravity and objects being able to stay on Earth;
- explain gravitational pull/force in context;
- synthesize information presented to determine the author's message;
- write a brief explaining what gravity is, how it affects people and things on Earth, how it affects objects in our solar system, and why it is important; and
- present their brief to a partner using complete sentences and clearly providing details about gravity.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- matter (explicit)
- gravitational pull/gravitational force (explicit)
- attraction (embedded)

The following words will be reinforced in this reading.

- galaxy
- matter
- gravity
- orbit
- satellite
- gravitational pull/gravitational force

DAILY TASK

Congratulations! You have just been hired as a spokesperson for important NASA astronomers. Prepare a brief to share with your partner what you have learned about gravity and why gravity is important. Write a brief explaining what gravity is, how gravity impacts people and things on Earth, and how gravity affects objects within our solar system. Then share your brief with a partner. Be sure your brief includes:

- introduce your topic;
- group related information together;
- add details and facts from the text;
- use linking words and phrases; and
- write an effective concluding statement.
-

Teacher's Note: Students will be practicing writing a brief and presenting it to a partner. Partners will read the brief, listen to the presentation of a brief, and provide feedback. The purpose is for them to practice in preparation for their end-of-unit task when they have to write a brief for the president. This task is meant to be completed after reading "What is an Orbit?"

POSSIBLE STUDENT RESPONSE
Gravity is a very important force in our solar system. Gravity is an invisible force that pulls between any object that has mass in the universe. The gravitational pull of Earth is what keeps us and everything else on the surface of the earth. Furthermore, the atmosphere we have is also pulled toward Earth by gravity. If there was no gravity to hold our atmosphere on Earth, we would not be able to breathe. Everything would float out into space, and life would not be able to exist. Gravity also keeps objects in an orbit around Earth such as the moon and manmade satellites. Gravity is essential for the survival of living things on Earth.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Pages 88-89	A force is a push or pull on an object or system. Who knows that attraction means? (Provide definition if needed.)	Attraction is an invisible force that pulls between two objects.
	What is gravity?	Gravity is the force that draws all objects toward each other in the universe. Gravity keeps us firmly planted on Earth.
	Matter is the stuff objects and people are made of. What is mass?	Mass is the amount of matter in an object.
	What are some examples from the text of how gravity pulls things toward the earth?	Gravity keeps our house, our bed, or a ball you throw up into the air on Earth.
	In second grade you learned what living things need to survive. Why is gravity important for living things?  (This is an opportunity for a collaborative talk structure.)	The text said that gravity keeps the atmosphere and oxygen close to the earth. I remember that living things need oxygen, so without gravity, living things wouldn't have the oxygen they need to survive.
	How does mass impact the gravitational pull between two objects? Provide an example from the text to support your response.	The larger the mass, the larger the gravitational pull. We have less mass so we would have less of a pull than an object with a large mass such as a planet. Because Earth has so much more mass than anything on its surface, its gravitational pull keeps those smaller things from flying out into space.

Page 89	Is the gravitational force on the moon stronger or weaker than on Earth? Why? What are the two factors that affect how strong the gravity is between two objects?	The gravitational force of the moon is weaker than the gravitational force of Earth, because the moon has less mass than Earth. The two factors that affect how strong gravity is between two objects is the mass of the object and the distance between them.
Page 90	Why don't we all get pulled into the sun? Use evidence from our text in your reasoning. Which has a stronger gravitational pull: the earth or the sun? Why is this? What holds our solar system together?	The distance between two objects affects the gravitational pull between them. The effect of an object's gravitational pull lessens as you get farther away from it. Because we are closer to Earth, its gravitational force has a greater effect on us. We are far enough away from the sun that we will not get pulled into the sun. The sun is the largest celestial body in our solar system and, therefore, has the strongest gravitational pull. This keeps all of the objects in our solar system orbiting it. However, the farther the distance from the sun, the less the gravitational pull the sun has on the object. The gravitational pull of the sun holds our solar system together.
Page 91	How are our everyday lives affected by gravitational pull of Earth? The moon? The sun? The galaxy?	Earth: People and objects on Earth stay on Earth. It keeps the atmosphere including the oxygen we breathe on Earth. The atmosphere is able to trap heat, which also makes life possible on Earth. Moon: The moon's gravitational pull affects the ocean tides on Earth. Sun: The sun's gravity holds Earth in its orbit around the sun keeping it the right distance for life to exist. Galaxy: Sometimes black holes are

		formed because gravity is extremely strong. The stars, planets, and all of the other things in the universe are held together in groups and clusters by gravity. Without gravity, everything would go flying out into space.
	What does the author want you to know about this topic? How do you know that is his message?	I think the author wants us to understand that gravity is important for our survival because the he tells us all the things gravity is responsible for, such as, keeping us on Earth, and keeping Earth in an orbit around the sun.

WHAT IS AN ORBIT? – READING 1, QUESTION SEQUENCE 1 DAILY TASK 4

TEXT
Text: "What is an Orbit?"
Question Sequence: First Read
Instructional Strategy: Shared Reading
Teacher's Note: This text will be paired with the article "Gravity".

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
560 L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is moderately complex. There are connections between ideas and the processes or events are explicit and clear. Text features such as headings, captions, enhance the reader's understanding of content. Graphics are integral to the understanding of the text.	Conventionality in this text is exceedingly complex because of its density. Example: "This is called geosynchronous Earth orbit. It is also known as GEO. Satellites in GEO orbit about 23,000 miles above Earth." Vocabulary is very complex due to the subject-specific and overly academic words. Example: geosynchronous, polar orbits, momentum. Sentence structure is moderately complex and most sentences are simple with few occasions for complex sentences.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The text is slightly complex. Its purpose is clear, concrete, and narrowly focused on planets and objects that orbit around the sun, and types of orbits. Headings include: "How do objects stay in orbit?" and "Where do satellites orbit Earth?".	The knowledge demands are very complex. This text relies on recognizable ideas mixed with abstract concepts such as momentum, gravity, and forces.

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LESSON OBJECTIVE(S) FOR *WHAT IS AN ORBIT?*

Students will understand that keeps objects in an orbit.

In today's reading, students will:

- explain using key details that orbits can have different shapes;
- compare details in this text and other texts in the unit about gravity;
- write a brief explaining what gravity is, how it affects people and things on Earth, how it affects objects in our solar system, and why it is important; and
- present their brief to a partner using complete sentences and clearly providing details about gravity.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- momentum (explicit)

The following words will be reinforced in this reading.

- orbit
- satellite
- gravity

DAILY TASK

Congratulations! You have just been hired as a spokesperson for important NASA astronomers. Prepare a brief to share what you have learned about gravity and why it is important. Write a brief explaining what gravity is, how gravity impacts people and things on Earth, and how gravity affects objects within our solar system. Be sure your paragraph includes:

- introduce your topic;
- group related information together;
- add details and facts from the text;
- use linking words and phrases; and
- write an effective concluding statement.

Teacher's Notes: Students will be practicing writing a brief and presenting it to a partner. Partners will read the brief, listen to the presentation of the brief, and provide feedback. The purpose is for them to practice in preparation for their end-of-unit task when they have to write a brief for the president. This task is meant to be completed after reading "Gravity" and "What is an Orbit?"

POSSIBLE STUDENT RESPONSE
Gravity is a very important force in our solar system. Gravity is an invisible force that pulls between any object that has mass in the universe. The gravitational pull of Earth is what keeps us and everything else on the surface of the earth. Furthermore, the atmosphere we have is also pulled toward Earth by gravity. If there was no gravity to hold our atmosphere on Earth, we would not be able to breathe. Everything would float out into space, and life would not be able to exist. Gravity also keeps objects in an orbit around Earth such as the moon and manmade satellites. Gravity is essential for the survival of living things on Earth.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Introduction Page 1	In our previous learning, we have talked about planets on a path or orbit. This text told us that the path is repeating and has a definite shape. Use what you know from our previous texts to infer why planets continuing on the same path might be important.  (This is an opportunity for a collaborative talk structure.)	From the text we've read so far, I know the sun provides heat and light in just the right balance and is necessary to survive on Earth. We also learned in "The sun, yellow dwarf star at the heart of the solar system" that the sun controls Earth's seasons, ocean currents, and weather. It seems if our orbit is always the same, then we would predict and expect the same seasons, currents, and weather patterns over and over, year-after-year.
Introduction Page 1	Based on learning from our texts, specifically from *Pluto's Secret and* "The Sun, yellow dwarf star at the heart of the solar system," what kind of experiments would you predict the International Space Station conducts? What do you think "international" space station means? How would you figure out the meaning?	I think the space station would conduct experiments that might help us live better on Earth by answering all the questions about space we have. Maybe they test to see if people could live in outer space too. They might test planets for types of weather, seasons, and water. If a planet has water, they might look for water currents. The word "nation" is in the middle of the word "international." The prefix "Inter-" means among or together and the suffix "-al" can mean it changes the word to an adjective and is the form of. Therefore, international space station must mean a space station that is between or shared between nations.
What Shape Is An Orbit? Page 2	Explain what you learned about the shapes of orbits.	Not all orbits are the same shape. They are ovals, but some can be more round than others.

How do Objects Stay in Orbit? Page 2	Explain how gravity and momentum work together and tell what these forces do for satellites. 	Gravity is a force that pushes objects toward Earth. The opposite force is momentum. It keeps an object moving or pull along the orbit path. When the push and pull is balanced, like tug-a-war, a satellite is able to remain in space.
How do Objects Stay in Orbit? Page 2	Using the information we've just discussed, what might happen if the gravity or momentum suddenly changed?	If the object/satellite had too much momentum/push, it would keep getting pushed out into space. On the other hand, if the object/satellite had too much gravity/pull, it would come crashing down from outer space.
Where Do Satellites Orbit Earth? Pages 2-3	Why does the author explain in great detail about the differences in orbits?	In the text about the dwarf sun, we learned the sun causes seasons, weather, and ocean currents on Earth. If we are on an orbit around the sun and the sun causes those things, then maybe another planet has them too. AND, because we know the sun is the perfect distance from the sun, then maybe other planets have life on them.

ALTERNATIVE SHARED READING OPTIONS
Other options for shared reads include this article written at a 630, 1030, or 1170 Lexile. 440 L https://newsela.com/read/lib-nasa-orbit/id/24067/ 740 L https://newsela.com/read/lib-nasa-orbit/id/24066/ 850 L https://newsela.com/read/lib-nasa-orbit/id/24068/

TEXT
Text: *The Planets* Read through pg. 19. **Question Sequence:** First Read **Instructional Strategy:** Shared Reading

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
AD 580L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The structure of the text is slightly complex. It is organized in sequential order of the planets from the sun. There is a clear introduction, followed by pages dedicated to exploring more specific details about each planet. The text also has a clear conclusion. The graphics add information to the information provided in the written material of the text. The text concludes with an additional facts page that, if used, would add more knowledge about the content.	The language features of this text are moderately complex. The text is mainly composed of simple sentences. There is moderate use of domain-specific vocabulary as well as an abundance of Tier 2 vocabulary words.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose of this text is moderately complex. The purpose is explicitly stated within the text, and there is also the ability to infer deeper meaning in relation to the unit concept and enduring understandings. It is mainly explicit; however, there are some complex concepts that would require deeper thinking to develop an understanding. There is also a mixture of simple and complicated ideas presented in the text.	The knowledge demands are moderately complex. The subject-matter relies on common practical knowledge as well as some discipline-specific knowledge.

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand that planets, including Earth, and other celestial bodies make up our solar system – one planetary system in the universe. Students will also understand characteristics of the inner planets.

In today's reading, students will:

- use illustrations to understand information presented in the text about the inner planets;
- discuss how the text structure conveys information about the planets;
- use key details to explain differences in each of the inner planets' orbits; and
- compare Earth to one of the inner planets.

VOCABULARY WORDS

The following words are introduced during this reading. Suggested instructional methods are included in parentheses.

- designated (embedded)
- atmosphere (embedded)
- environment (embedded)

The following words will be reinforced during this reading.

- solar
- dwarf
- orbit
- rotates
- gravity
- astronomers

DAILY TASK

Graphic Organizer:

As you read *The Planets*, complete the Dash Facts collection page found in your student packet. Record three key words from sections of the text, then write a dash fact (sentence) using those keywords. After reading the entire text, you will have collected facts on each planet.

Writing Task:

Using your Dash Facts collected for the first four planets in the text, select a planet to compare to Earth. Are there any similarities to Earth? What differences do you notice? Write a paragraph to summarize your information.

Your writing should:

- introduce your topic;
- develop the topic with facts, definitions, and details;
- use linking words and phrases to connect ideas;
- use precise language from the vocabulary you studied while learning about each planet;
- provide a conclusion to provide closure for your readers.

Teacher's Note: In order to convey expectations for the Dash Facts collection page, consider modeling identifying three key words and writing a dash fast with those three words for the planet Mercury.

Students will record additional information about each planets weather on the Dash Facts pages while reading Solar System Forecast.

POSSIBLE STUDENT RESPONSE
Venus and Earth have many unique qualities. First of all, these two planets are similar in size. They are also side by side in the solar system. Venus is the second planet from the sun. Earth is the third planet from the sun. Because Earth is farther from the sun, it has a longer year than Venus. However, only one day on Venus is about 243 Earth days! Its distance from the sun also makes Venus very hot. It is about 67 million miles from the sun. In contrast, Earth has just the right environment to support life. It is about 93 million miles from the sun. It is interesting to learn how these planets that are similar in size and proximity to the sun can be so different in other ways.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 5	How does thinking about the origin of the word *planet* and what you already know about planets, help you understand how they are different from a star?  (This is an opportunity for a collaborative talk structure.)	The word *planet* comes from the Greek word meaning "wanderer". A planet is always revolving around the sun, but a star doesn't change its position in the sky.
Page 7	As you think back to our anchor text, *Pluto's Secret*, what reason did astronomers have for designating Pluto as a dwarf planet?	Pluto doesn't follow all the rules for being a planet. Although it is round and orbits the sun; Pluto isn't alone in its orbit.
Pages 8-9	How does the illustration help you understand why it's called a solar system?	The text said that solar means "connected to the sun". I can see in the illustration that planets such as Earth circle the sun.
Page 11	The text has given us some details about the differences in stars and planets. What are some of the differences, and how might knowing those differences help you determine what you are looking at in the night sky? Why are we able to see both stars and planets?	Earlier the text said stars are bigger than planets and give off their own heat. On this page we learned that stars twinkle, but planets look like a steady light. We can see stars because they are made of burning gases which produces light. We can see planets because they reflect the light of the sun.
Pages 14-15	How are the days and years on Venus different from Mercury? Explain how a day on Venus can be longer than a year.	A year on Mercury is only 88 Earth days. A year on Venus takes 225 Earth days. A day on Mercury is 59 Earth days, but a day on Venus is longer than its year! A day on Venus is longer than a year, because a day is how long it takes the planet to spin, or rotate, on its axis. The

		text said that Venus rotates very slowly, so this must mean it rotates slower that it revolves around the sun.
Pages 18-19	What is the significance of Mars once having rivers and maybe an ocean? How is this text organized compared to other texts we've read so far in this unit? Why did the author organize it this way?	This is exciting because scientists are looking for evidence of previous life forms on Mars. This text is organized with titles, illustrations, and captions. I think the author did this so it would be easier for us to learn information about each of the planets. I know which planet each page is about.
After reading Page 19	What are you noticing about the length of each planet's year?  Based on this pattern, what can we predict about the other planets orbits? *Teacher's note: Students may need prompting to realize that the first 2 planets' years were compared to Earth days, but Mercury's year is compared to Earth years.*	As we learn about planets in order of their distance from the Sun, we see that each planet's orbit around the Sun is getting longer. The farthest planets from the Sun will have the longest orbit path.

TEXT

Text: *The Planets* Read pgs. 20-32

Question Sequence: Second Read

Instructional Strategy: Shared Reading

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand that planets, including Earth, and other celestial bodies make up our solar system – one planetary system in the universe. Students will also understand characteristics of the outer planets.

In today's reading, students will:

- use illustrations and text features to locate information about the outer planets;
- use key details to explain differences in the inner and outer planets;
- engage effectively in a collaborative discussion by expressing ideas clearly about gravity and the planets while building on others' ideas; and
- assume the role of the author, and using new knowledge gained, create an additional page for the book about a 10th discovered planet past Pluto.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- dense (embedded)
- surface (embedded)

DAILY TASK

Graphic Organizer:
As we read the final section of the text, you will complete the Dash Facts collection page for *The Planets* Record three key words from sections of the text, then write a dash fact (sentence) using those keywords. After reading the entire text, you will have collected facts on each planet. (See the template included in the accompanying student packet.)

Speaking Task:
Think back to the text we read called "Gravity". Go back to your daily task on gravity. Read your response and your partners before discussing the prompt below.
If you were able to live on another planet, how would the effects of gravity affect your everyday routines? How would living on this planet be different from living on Earth? Pick a planet. Answer these 2 questions with a partner. Consider what you have learned in this text, as well as other texts in the unit.

As you participate in this task, remember to:

- engaging effectively with your partners; and
- build on your partner's ideas and express your own ideas clearly.

Teacher's Note: You may also assign each pair a planet to discuss together and then share out with the group so all planets have been represented to the whole group.

Writing Task:
Imagine you are an astronomer that searches the skies for new discoveries. You have just found a new planet past Pluto! Your job is to add a page to Gail Gibbon's book, *The Planets,* to teach others about the new planet you discovered. Follow Gail Gibbon's style and craft. Think about what you have learned in this text and others in the unit to create an additional page for the book.

Teacher note: Encourage students to be creative, but to use knowledge they have gained about planets to create their page.

POSSIBLE STUDENT RESPONSE

Speaking Task:
During the speaking task, student responses should demonstrate that living on a planet with a larger mass would increase the gravitational pull, making it more difficult to move while living on a planet with less mass would have less gravity therefore affecting how things would move in a different way. Some students may also make the connection to the effects of gravity related to their location to the sun. Students should discuss things like how long a day or year is, how many moons they might see, and what the temperature might be like.

Writing Task:
Students' pages should mirror the style of *The Planets.* They should have text with illustrations and text features. They should describe their newly discovered planet as having longer years because it is past Pluto. They should write about their planet's day. They may write about and illustrate things like temperature, size, and moons.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Pages 20-21	Using the illustration and the text, what are some key differences between Jupiter and the inner planets (Mercury, Venus, Earth, and Mars)?	The illustrations show that Jupiter is significantly larger than the inner planets, and Jupiter has rings. The text says that Jupiter is made of mostly gases, which is different from the inner planets that have a surface.
	How do the text features on this page help you make sense of the text?	The labels of the rings help me to see that they are small; the text said "thin". The label of the Great Red Spot helps me to understand what it meant by "giant red circle", but I'm wondering if the planet actually has a red spot on its

		surface, or if the red spot is in the planet's atmosphere.
Page 21	What does it mean that 62 moons 'orbit' around Jupiter?  (This is an opportunity for a collaborative talk structure.) How long is a day on Jupiter? What does that tell us about Jupiter?	Moons orbiting Jupiter means that the moons travel around the planet, or orbit the planet. A day on Jupiter is 10 Earth hours, which means it rotates, or spins quickly.
Pages 22-23	How long is a year on Saturn? Thinking back to your prediction from yesterday, what can you anticipate about Uranus and Neptune's orbit? Do you expect it to be shorter or longer than Saturn? Why? 	A year on Saturn is equal to 30 Earth years. I think Uranus and Neptune will have longer years than Saturn because they are farther from the sun than Saturn.
Pages 26-27	Why does Neptune appear to be blue? What might Neptune have in common with Earth?	It has a gas in its atmosphere that makes the planet appear blue. Earth appears blue from space, too. However, Earth seems mostly blue because of all the oceans on our planet. Also, one of Neptune's moons is about the same size as our moon.
Pages 30-31	Why are astronomers important? What have we learned as a result of their studies?	Astronomers make new discoveries that help us learn more about our solar system. Once, people only thought there were six planets. Now, we know that there are eight planets that revolve around the sun.
After reading Page 32	Based on what we have read, what do you think a planet that was past Pluto might look like? How long might its days and years be?  What do you think the writer had to do to be able to write this book?	I think the planet would be really small and have lots of moons. It would take it a really long time to revolve around the sun. It would be really cold because it is so far away from the sun. I think the author probably had to do lots of research on the planets. She had to know so many facts about each of the planets!

TEXT
Text: *Solar System Forecast* **Question Sequence:** First Read **Instructional Strategy:** Interactive Read Aloud

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
890L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is slightly complex. The text explores the weather patterns on each planet in sequence of their closeness to the sun. The structure is generally simple, following that of a news report, with a clear beginning and ending to the weather forecast.	The language features are moderately complex. The conventionality of the text is mainly explicit and easily understood; however, the high usage of academic vocabulary increases the complexity of the text. The text also presents a variety of sentence types, varying from simple to compound while including small amounts of complex sentences.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose of the text is slightly complex. Students are to gain that the different planets have different weather patterns. However, the connection and relationship to the sun is a deeper meaning students can gain with the use of inferring and synthesizing learning gained from previous texts.	Due to the connection and strong use of domain-specific academic vocabulary used throughout the text, the knowledge demands are moderately complex. While students will have had exposure to the Earth as a planet and the idea of weather and seasons on Earth, students have not yet been exposed to the bigger picture of our solar system as a unit within the larger universe.

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand that each planet has unique weather.

In today's reading, students will:

- use illustrations and words to demonstrate an understanding of the different types of weather found on each planet;
- connect what we have read in previous texts to describe the cause/effect relationship between why planets have particular weather based on their position related to the sun; and
- write to persuade NASA which planet would be best for taking people.

VOCABULARY WORDS

The following words are introduced during this reading. Suggested instructional methods are included in parentheses.

- advisory (embedded)
- forecast (embedded)
- greenhouse effect (explicit)
- appearance (embedded)
- raging (embedded)
- electrifying (embedded)
- voyagers (embedded)

The following words will be reinforced during this reading.

- orbit
- solar system
- surface
- atmosphere

DAILY TASK

Graphic Organizer:

As we finish reading the text *Solar System Forecast* today, complete the Weather Connection section of the Dash Facts graphic organizer (from *The Planets*) to describe the weather on each planet. Be sure to use key details from the text describing the weather.

Writing Task:

NASA (National Aeronautics and Space Administration) is considering taking people to other planets in the solar system. Using information you've gained in the unit so far, and the research notes you've collected in your Dash Facts graphic organizer, imagine you are the meteorologist from the Solar Weather Channel. Create a news report titled "Go Here, Not There" to persuade NASA to take people to one planet instead of another one. Your news report should do the following:

- introduce your two planets;
- develop your opinion of which planet to travel to instead of another planet;
- provide reasons to support your opinion on why one planet is better for travel than the other;
- consider weather conditions, what you would need to take with you, how you would get your oxygen, and how you would stay warm or cool;
- provide a concluding statement or section; and

- use linking words and phrases to connect your opinion and reasons.

Teacher's Note: Students can reference supplemental pages at the end of Solar System Forecast *if needed.*

Optional Speaking Task: Students can present their news report to the class.

POSSIBLE STUDENT RESPONSE

Breaking News! "Go Here, Not There"

This is your meteorologist from the Solar Weather Channel. I've heard NASA is considering taking people to one of the other planets in our solar system. You should definitely take people to Mars instead of Mercury! Mars is only 49 million miles away from Earth, while Mercury is 57 million miles away from Earth. Therefore, it would be faster to travel to Mars instead of Mercury. Mars has beautiful pink sunsets that travelers would love to see, but Mercury doesn't have an atmosphere. It would be easier to pack clothing for Mars than Mercury. Temperatures on Mercury range from very, very hot, to very, very cold, but the temperature on Mars is more stable. You would still need a space suit that protects you from cold temperatures because it can be below 100° Fahrenheit on Mars. You would also need to make sure your space suit can provide you with oxygen since the atmosphere there doesn't have any. Mars is the better choice for taking visitors. Good luck NASA! I hope your travelers have a great time!

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Pages 3-4	Why would there be a travel advisory for visiting the sun? What specific evidence does this text give you to support your answer?	Solar winds with shooting gas make exploration to the sun dangerous. The sun is also extremely hot.
Page 5	How does the lack of an atmosphere impact the temperature on Mercury?	The lack of an atmosphere on Mercury means there is no way to trap heat, so there are high temperatures during the day and very cold temperatures at night.
	Would you want to travel to Mercury? Why or why not? (This is an opportunity for a collaborative talk structure.)	I would not want to travel there because the temperature changes are so extreme. This would make planning for what to wear really hard!
Page 7	What do you recall about Venus' temperature based on its position from the sun from our earlier readings in the text, *The Planets*?	When we read The Planets, we learned that Venus is a hot planet.
	Why do you think this is? How do the clouds on Venus impact the temperature? *Teacher's Note: The "greenhouse effect" refers to a warming of Earth's surface and the air above it. It is caused by gases in the air that trap energy from the sun. These heat-trapping*	The clouds trap the sun's heat, forcing Venus into a constant greenhouse effect, making it extremely hot.

	gases are called greenhouse gases. The sun's heat gets trapped in the atmosphere of Venus. What is the relationship between the sun and Venus' temperature? What additional information do you see in the picture that tells you something about the weather on Venus?	The sun gives off heat, and Venus' clouds and atmosphere trap the heat from the sun. This makes Venus very hot. There is a cause-and-effect relationship between the sun and Venus. In the picture, you can see what might be lightning, which makes me think there could be storms on Venus.
Page 11	How do the author and illustrator help us to understand the term "dust devils"?	The phrases "watch out for" and "spinning like little tornadoes" are clues the author used to help us understand what dust devils are. The picture painted by the illustrator makes it look like dust devils are swirling gusts of wind or small tornadoes.
Page 15	The author says not to let Saturn's appearance fool you. What is the author really trying to say about weather on Saturn? Would you want to travel to Saturn? Why or why not?	The author is saying that even though its surface appears smooth, it can be a dangerous place. The text stated that there was a recent lightning storm on Saturn that covered an area as big as the United States, and that the weather can be electrifying. I've heard that lightning storms can be really dangerous, and since Saturn has really big lightning storms, I would not want to travel there.
Page 21	What type of extreme weather on Neptune would cause you to need to 'hang onto your hats'?	Neptune has very high wind speeds, which makes it the windiest planet in the solar system.
Page 23	What do you know about Pluto that helps explain this extreme weather?	In *The Planets*, Gail Gibbons explains that Pluto is 4.6 billion miles from the sun, which makes it very cold. This extremely cold weather is because Pluto is so far away from the sun.

RESOURCES
Weather in Space (Rocky Planets): Crash Course Kids https://www.youtube.com/watch?v=Dvhl891zGqU&index=7&list=PL0Xx2-Ve48VWtFwE74PQl6cEvA9QkiQ_T Gas Giants Weather: Crash Course Kids https://www.youtube.com/watch?v=WoPtsnIcSv8&list=PL0Xx2-Ve48VWtFwE74PQl6cEvA9QkiQ_T&index=8

ZATHURA - READING 1, QUESTION SEQUENCE 1, DAILY TASK 8

TEXT
Text: *Zathura* **Question Sequence:** First Read **Instructional Strategy:** Shared Reading

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
540 L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The structure of the text is very complex. The organization of the text includes time and space shifts and complex characters. The detailed illustrations support and extend the meaning of the text.	The text is very complex due to unfamiliar and subject-specific vocabulary use. There are also many examples of complex sentences with several subordinate phrases or clauses.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
While the primary purpose of this text is very complex. The theme of text is subtle and revealed over the entirety of the text. There is also the ability to infer deeper meaning in support of disciplinary understandings about space.	The knowledge demands are very complex. Although many readers can make connections to family experiences portrayed in the text, the references to space concepts may be unfamiliar to readers without necessary prior knowledge. The text also makes an indirect reference to a previous text by the same author.

LESSON OBJECTIVE(S) FOR THIS READING
Students will understand that authors sometimes include scientific information within a fictional text to make the story more believable. In today's reading, students will: • use information gained from words and illustrations to support understanding of our universe and its components; and • compare and contrast details in this text and others in the unit to determine what is accurate scientific information and what is fiction.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- meteor (embedded)
- meteor shower (explicit)
- polarity (embedded)
- gravity belt (implicit)
- gyroscope (explicit)
- vessel (implicit)
- evasive (explicit)
- defective (embedded)
- malfunctioning (embedded)

The following words will be reinforced in this reading:

- gravity
- galaxy
- black hole

Teacher Note: A video clip of a working gyroscope may be helpful to build student understanding about its purpose and how it works.

A resource to support knowledge of meteors is https://spaceplace.nasa.gov/meteor-shower/en/.

DAILY TASK

Thinking about what you already know about space, select an event from the story that the author used to convey accurate scientific information. How did the author demonstrate that space concept accurately in the text? In contrast, what imaginary concepts or facts about space did the author include in the story?

In your paragraph, be sure to:

- Introduce a topic;
- group related information together;
- develop the topic with facts, definitions, and details;
- provide a conclusion;
- use linking words and phrases to connect ideas within each category; and
- use specific vocabulary from our text.

POSSIBLE STUDENT RESPONSE

Mr. Van Allsburg used a combination of real space facts and imaginary ideas in the story, *Zathura*. For example, at the beginning of the story Walter and Danny experienced a meteor shower that destroyed the roof of their home and crushed their television. Although meteors, which are space rocks that enter the Earth's atmosphere, burn up before reaching Earth; this is something that the brothers might have experienced if traveling through space. In contrast, later in the story a space pirate boarded their vessel. Mr. Van Allsburg described the pirate as having a scaly tail and lizard-like legs. Although that was make-believe, it made the story more exciting for me. I loved how Mr. Van Allsburg only drew the lower half of the pirate climbing down from the ceiling. It really helped me use my imagination think about what the pirate might have looked like. The combination of both realistic and scientific details, as well as, imaginary ideas work together to make this a riveting story.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 5	Danny's first card reads "Meteor showers, take evasive action." Based on the last line on this page (re-read the last sentence), what is happening and what is the card warning Danny to do?	A shower of meteors must be hitting the roof. The card is warning Danny to take action and get out of the way to avoid the meteors.
Pages 7-8	Look at the illustrations on these pages and the 2 previous pages. What clues is the author giving us in the illustrations that it's outer space?	On the two previous pages, I can see that it's sunny outside the window and there's a tree. On these pages I can see stars and darkness outside the window.
Pages 11-12	Walter says that he has lost his gravity. Think back to when we read about gravity. Why is Walter on the ceiling? (This is an opportunity for a collaborative talk structure.) How is the author using accurate facts with fiction?	In space, I know gravity isn't the same as on Earth. I'm thinking that because they are now floating in space, Walter has floated to the ceiling instead of being able to stand on the floor. I wonder if the "gravity belt" is like something astronauts wear to walk on the moon where there's no gravity. The author is combining real things like no gravity in space, with make believe things like their house floating into space.
Pages 13-14	What is the purpose of the gyroscope and what impact does its malfunction have?	The gyroscope would have been creating a force to keep the floating house upright. Since the gyroscope malfunctioned, or failed, the house titled suddenly.
Pages 15-16	As we continue to think of all we learned about gravity, what could "Tsouris 3" be?	Tsouris 3 must be a really large planet with a lot of gravitational pull. The larger the mass, the larger its gravitational pull. The Budwing house must have passed close to the surface of Tsouris 3. Objects that are close to each other pull harder than objects that are far away.
Pages 17-18	What affect is the increased gravity having on Danny?	The gravitational pull of Tsouris 3 was so strong that Danny was getting shorter and wider. Gravity must have been pulling hard on Danny.
Pages 19-20	Would this encounter with a Zorgon be supported in a non-fiction book about space? Explain your thinking.	No, there is currently no evidence of any other life forms except on Earth.

Pages 21-22	Why do you think the author chose to include a robot that detects alien life forms and alien pirates into his story?	The author may have wanted to add to the suspense of the story and make the readers really wonder if Walter and Danny would ever make it back to Earth.
Pages 23-24	Where do Danny and Walter find themselves now? What part of the story does this connect back to?	The black hole swallowed them up and then emptied them right back at the park across from their house. This makes me think of the very beginning of the story when the board game was first discovered.
After page 27	How did the author's use of information about space and his illustrations help make this story more interesting? How did your understanding of space help you make sense of the story? 	The author's use of information about space and his detailed illustrations made a make-believe story seem almost real at times! Knowing about gravity, meteors, and black holes helped me understand the story in a better way. I would have been confused without my new learning about space.

ZATHURA - READING 2, QUESTION SEQUENCE 2, DAILY TASK 9

TEXT

Text: *Zathura*

Question Sequence: Second Read

Instructional Strategy: Shared Reading

LEARNING OBJECTIVE(S) FOR THIS READING

Students will understand that authors sometimes include scientific information in fictional settings to help support events and characters in the story to develop the central message.

In today's reading, students will:

- examine the growth and change of Danny and Walter as a result of their experiences with the board game in order to determine the central message; and
- explain how Danny and Walter's actions and dialogue helped communicate the central message.

VOCABULARY WORDS

The following words will be reinforced in this reading:

- gravity
- galaxy
- black hole

DAILY TASK

Yesterday, we explored how Danny and Walter's adventures in *Zathura* compared to realistic experiences in outer space. Re-read what you wrote in your packet about some of realistic and imaginary events that took place in the book. Now, consider how Walter and Danny's reactions to those events shaped these characters from the beginning of the story through the ending. Explain, using key details from the text how Danny and Walter's actions and dialogue helped communicate the central message. Use our class anchor chart to help you write your paragraph.

In your paragraph, be sure to:

- introduce a topic;
- group related information together;
- develop the topic with facts, definitions, and details;
- provide a conclusion;
- use linking words and phrases to connect ideas within each category; and
- use specific vocabulary from our text.

POSSIBLE STUDENT RESPONSE
The adventures of Walter and Danny, while playing the board game Zathura, changed their relationship forever. At the beginning of the story, the brothers were always fussing and arguing. Walter didn't even want him around! He even asked his mother and father to take Danny with them as they left for the evening. Through the board game the author crafted a series of realistic and make-believe events that forced Walter and Danny to learn to get along and work as a team. For example, when Walter lost his gravity, Danny saved him by tossing the television cord up to him. Walter tied it to his belt. Then, Danny tied the other end to the sofa. Also, when the defective robot was about to attack them, the brothers worked together to knock over the robot. Walter rolled Danny across the room like a giant ball. Then, Walter told his brother he was terrific. Walter and Danny show us that families need each other and that we can work together to solve problems. I really think that is the central message of Zathura.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 1	How would you describe Walter and Danny's relationship? What evidence supports this?	Walter and Danny are probably like many brothers. They can't seem to ever get along. Walter was pulling his Danny's' ears and nose while they were playing in their bedroom.
	Why do you think the author introduces these characters this way?	I think the author wanted the readers to relate to the characters right away. They seem so real! At first, this made me wonder if they would fuss and fight through the whole story.
Page 3	How does Walter feel about the board game? How do you know?	Walter thinks it's isn't something he would want to play. I know because he pokes it in Danny's stomach and says "it's for babies like you."
After reading pages 1-4	*Teacher note: Take a deeper look into the main characters of this story by recording some specific actions and dialogue in the story on an anchor chart in order to help students better understand how Walter and Danny change throughout the story.*	*See sample anchor chart in the "Resources" section of this lesson.*
	What happened at the park that reveals how Walter and Danny feel about each other?	Danny beaned him with a baseball while in the park. Then, Walter called him a name.
Pages 9-10	Walter says, "Great, up here, with you, forever." How does Walter's language show his feelings? What other evidence in the text helps you know how he feels?	Walter is frustrated that he might be stuck in space with his little brother forever. The text says he took a deep breath. I do that too when I'm frustrated about something.

	 (This is an opportunity for a collaborative talk structure.)	
Page 17	What do you notice about Walter's reaction to his brother after he bowled over the robot? So far, how are the events of the story helping change Walter and Danny? 	Walter actually gave Danny a compliment! He patted his head and said, "You were terrific." They are starting to rely on one another for help. They haven't seemed to argue with one another in space.
Page 20	On this page, we read the author's words, "It seemed hopeless." What encouragement does Danny give him?	After Walter expressed that they weren't going to finish the game, Danny encouraged him by saying, "Sure we are." Danny said that they could do it by working together, "Me and you."
Page 23	As Walter disappears into the black hole, what do you think he wanted to say to Danny?	Student answers may vary: I think he wanted to tell Danny he really liked having him for a brother. I think he wanted to tell Danny he was sorry for always picking on him. I think he wanted to tell Danny how much he really loved him.
Page 27	How do the illustrations and dialogue reveal a change in Walter and Danny's relationship? How have their opinions of each other changed? Support your answer with specific details from the text. What central message was the author trying to convey in this text?	Both the illustrations and the author's words tell us that Walter has his arm around his brother. Also, Walter finally invites Danny to play catch. This makes Danny smile. At the conclusion of the book, they repeat the phrase, "Me and you, together." Even if the space adventure was real or imaginary, the boys have become closer. Walter seems to want to protect his little brother. Danny is finally getting to play with Walter. On the last page of the text, Walter asked Danny to play catch. He never wanted to do that with his brother before. Danny's smile shows that he is happy about his brother's attention. Student answers may vary:

		We all need to be kind and try to get along with others. Families should spend time together and depend on each other. We can accomplish more when we work together.

RESOURCE			
Sample Anchor Chart:			
	Actions	**Dialogue**	**Our Noticings**
Beginning	Walter pulls Danny's ears and nose.	"Danny started it. Look what he did." "Can't you take him with you?"	Walter and Danny just can't get along. Walter doesn't seem to like having a little brother and doesn't want him around.
	Danny beaned Walter with the ball.	"All right, you little fungus, now you're really going to get it."	Danny wants to play with his big brother.
Middle	Danny bowls over the robot.	"You sure did", he said, patting his brother's head. "You were terrific."	Walter gives Danny a compliment. Danny is helping Walter. Walter and Danny aren't arguing.
	The brothers had been playing almost 3 hours and were far away in another galaxy. Danny grins.	"We're never going to make it." "Sure we are." "We can do it." "You and I." "Together."	Danny is encouraging Walter.
End	Walter puts the game in the trash. He puts his arm around Danny. Danny smiled.	"Let's go play catch." "You mean together, me and you?" "Yeah, that's right. Me and you, together."	Walter is protecting Danny. Walter wants to play with Danny. Danny is happy.

Galaxies, Galaxies – READING 1, QUESTION SEQUENCE 1, DAILY TASK 10

TEXT
Text: *Galaxies, Galaxies* **Iteration:** First Read **Instructional Strategy:** Interactive Read Aloud

TEXT COMPLEXITY ANALYSIS	
QUANTITATIVE COMPLEXITY MEASURES	
880L	
QUALITATIVE COMPLEXITY MEASURES	
TEXT STRUCTURE	**LANGUAGE FEATURES**
The text structure is very complex. Organization of text provides information on the outside edges of each page in an expository structure. The inside of each page consists of short, standalone pieces of text like in an encyclopedia or glossary. Connections between expanded ranges of ideas contain multiple pathways and discipline-specific traits. This text includes text features, such as diagrams of the solar system and different types of galaxies. The illustrations are drawings that support the readers' understanding.	Language features are very complex. Both simple and compound sentences are presented with clarifying clauses included. Placement of clauses at various locations changes the sentence length and has students focus on meaning. Vocabulary is subject-specific and overly academic.
MEANING/PURPOSE	**KNOWLEDGE DEMANDS**
The purpose is very complex. Although it is explicitly stated throughout the text, there are many abstract ideas that require students to infer meaning.	Knowledge demands are very complex. This text relies on moderate levels of discipline-specific knowledge and includes a mix of recognizable ideas and challenging abstract concepts. There are some references to outside ideas and theories.

LESSON OBJECTIVE(S) FOR THIS READING

Students will understand that our knowledge of the solar system and universe has changed and will continue to change through observations and technologies.
In today's reading, students will:

- use text features to understand how telescopes help scientists learn more about the universe;
- determine the main idea that our knowledge about the universe has expanded due to advancements in technology; and
- explain how over time technology has helped scientist learn more about the universe.

VOCABULARY WORDS

The following words are introduced during the reading. Suggested instructional methods are included in parentheses.

- technological advancements (explicit)

The following words will be reinforced in this reading:

- astronomers
- Milky Way
- gravity

Teacher's note: Technological advancements is not specifically in the text. However, it will be an important term to help students label the new inventions.

DAILY TASK

Using text-based evidence, the anchor chart, and our class discussion, what advancements in technology have resulted over time that helped scientists learn more about the universe?

Select at least four technologies that helped scientists learn and make new discoveries about our universe. Write to **describe** these four technological advancements in order, and **how** each technology helped scientists to learn new information about our universe. In your writing, be sure to:

- include an introduction;
- use information from the text to describe at least four technological advancements that helped scientists learn more about the universe;
- use information from the text to describe how the new technology helped scientists learn new information about our universe;
- use linking words and phrases to connect your ideas;
- use vocabulary words from the text to explain your thinking; and
- write a concluding statement.

Teacher's note: You will be creating a class timeline anchor chart of the inventions throughout the book. Please see attached example in the Resource section that follows the question sequence.

POSSIBLE STUDENT RESPONSE
In ancient times, scientists only knew about the night sky by looking up with their own eyes and trying to figure out our universe. This gave them limited information about what was really happening. Everything changed in 1608, when Hans Lippershey created the spyglass. The spyglass helped scientists see objects in the night sky closer than they could before with just their own eyes. Next, Isaac Newton helped further this work with the invention of the reflecting telescope in 1666. The reflecting telescope had a stronger magnifying glass, which gave scientists more details in the night sky. With more details, both astronomers and scientists could determine more about the planets, stars, and the universe. What really changed the technological advancements in more modern times was the ability to see not just from the Earth's surface, but to have telescopes in Earth's atmosphere. This gave the scientific world the ability to see galaxies billions of light years away with the Hubble Telescope in the 1990s. Finally, today scientists use space probes like Voyager I, which can explore space and send back discoveries to astronomers on Earth. Technological advancements have granted scientists new tools which have led to new discoveries about our universe from ancient to modern times.

PAGE/PART OF TEXT	QUESTION SEQUENCE	EXEMPLAR STUDENT RESPONSE
Page 5	What is the Milky Way galaxy comprised of? How does it keep its form?	The Milky Way galaxy is made of stars, clouds of gases, and dust that are held together in its center. Gravity helps it keep its shape as it orbits in the universe.
Page 9	How were early understandings and drawings of what was seen in the sky instrumental (or very important) in naming our galaxy? Use evidence from our text in your response.	Ancient Greeks and other civilizations made drawings of what they saw in the night sky to help them understand what a star was. They noticed groups of stars together that looked like a band. The Greeks believed the white band looked like milk and thought it was made from one of their gods when he was a baby. They named this group of stars the "river of milk".
Page 13	How did technology change our understanding of the universe? Why is this important?  (This is an opportunity for a collaborative talk structure.)	Scientists have discovered how big the Milky Way is using telescopes. It is important because they know it holds many other galaxies inside of it. The telescopes showed them different colored stars.
Page 23	Why do you think the author including these pages on the different types of galaxies?	I think the author wanted us to know that without the advancements in technology, we wouldn't have known about these other galaxies.

<table>
<tr>
<td>Page 25</td>
<td>So far we have learned about technological advancements scientists made that were used on the surface of the Earth. What were at least two of those technological advancements, and how did they help scientists learn more about the universe.
  </td>
<td>
<table>
<tr><td>Spyglass</td><td>To see the distant objects in the sky</td></tr>
<tr><td>Refracting Telescope</td><td>See objects in the night sky even closer</td></tr>
<tr><td>Reflecting Telescope</td><td>Smaller in size, but a stronger magnifying lens to see more details in the sky</td></tr>
<tr><td>Observatories</td><td>Using huge reflecting telescopes to see deeper in the universe</td></tr>
</table>
</td>
</tr>
<tr>
<td>Page 29</td>
<td>How can technological advancements like space probes and the Hubble Telescope give astronomers new information they never had before?</td>
<td>Because the space probes and the Hubble Telescope orbit above the Earth’s atmosphere, they can see deep into the universe and transmit discoveries back to Earth. Before these technological advancements, inventions were on Earth’s surface which did not give them as much viewing power as the space probes and Hubble Telescope in space.</td>
</tr>
<tr>
<td>Page 31</td>
<td>Why are we able to have all these books we have read in our unit about the solar system?

Gail Gibbons uses different text structures in this book. Why is this structure a good choice for this topic?
 

How do you think technologies will continue to change our understanding of the universe and solar system?</td>
<td>Advancements in technology enable us to have these books by providing new scientific information for authors to write about.

This structure is helpful because the book is about things I’ve never seen before. The illustrations and text features such as labels and captions help me make sense of things I may never be able to see with my own eyes.

I think we will continue to develop new technologies that will allow us to see even further into space.</td>
</tr>
</table>

TN Department of Education

RESOURCE

Technological Advancements That Helped Scientists Learn More About The Universe

Page	When?	Who?	Technology	How did it help?
Page 9	Ancient times	People looking to learn more about the sky	Eyes to look	They tried to create maps of the sky
Page 10	1608	Hans Lippershey	Spyglass	To see the distant objects in the sky
Page 10	1609	Galileo Galilei	Refracting Telescope	See objects in the night sky even closer
Page 11	1666	Isaac Newton	Reflecting Telescope	Smaller in size, but a stronger magnifying lens to see more details in the sky
Page 25	Today (modern times)	Scientists	Observatories	Using huge reflecting telescopes to see deeper in the universe
Page 26	Today (modern times)	Scientists	Different kinds of energy (X-rays, gamma rays, ultra violet radiation, and radio waves)	Discover new galaxies
Page 27	1990s to today (modern times)	Scientists	The Hubble Telescope	Located above Earth's atmosphere, you scientists can see galaxies billions of light years away
Page 28	Today (modern times)	Scientists	Space Probes like Voyager I	Can explore space and send discoveries back to astronomers on Earth

Note: The end-of-unit task gives students the opportunity to independently answer the essential questions for the unit and to demonstrate their understanding of the unit concepts. The end-of-unit task prompts student thinking, speaking, and writing about unit texts that reflects the demands of the grade-level literacy standards. In addition, the end-of-unit task provides students a chance to demonstrate their understanding in an authentic and meaningful context.

END-OF-UNIT TASK

Students, imagine you are a junior NASA (National Aeronautics and Space Administration) scientist that has been studying our solar system. The president has asked you if we can relocate people to other planets. Prepare a brief for the president on why Earth is ideally suited for life but the other planets are not.

Be sure to do the following when you write your brief:

- write an introduction;
- use information from unit texts to explain why earth is ideally suited for life;
- use information from unit texts to explain why each of the other planets in our solar system is not suitable for life. In your explanations, be sure to talk about the specific characteristics the planet has based on its position in relation to the sun;
- use linking words and phrases to connect your ideas;
- Use vocabulary words from our words of study: climate, patterns, distance, atmosphere, surface; and
- write a conclusion statement.

Pretend your classmates are presidential advisors whose job is to provide feedback on your brief before you send it to the president. When you are finished writing your brief, present it to the advisors. After they have provided you feedback, make necessary revisions to your brief before submitting.

When you are playing the role of the advisor, ask clarifying questions. Some possible questions are as follows:

- What might be some other key facts?
- How could you use the vocabulary words in your writing?
- What is your main message to the president?
- In what ways are you connecting your ideas together?

STUDENT RESPONSE

Mr. President,

After much study, scientists at NASA have concluded that Earth is the only planet where people can live. We have determined that the sun provides Earth with heat, light, and climate patterns that allow for life to exist. Earth is just close enough to the sun, but also just far enough away, which means it has the perfect distance from the sun to create the right conditions for life.

In order to make the most informed decision about the relocation of people, we also researched conditions found on other planets. We have provided a brief supporting reason as to why the other planets will not be suitable for life.

- Mercury has no atmosphere because of solar winds from the sun. That is why Mercury can't trap heat and has extreme temperature changes.
- The temperature on Venus is incredibly hot due to clouds trapping in the heat from the sun.
- Mars does not have the oxygen needed for humans to breathe.
- There is no surface on Saturn for people to stand on, because it is made from gases. It is also extremely cold.
- Uranus is also a gas planet and does not have a surface that would support life.

- There is methane gas on Neptune that is below freezing, and the wind speed can reach up to 1,500 miles per hour.

NASA plans to conduct future research on the idea of life on Mars. For now, Earth is the only planet that can sustain human life.

Note: The end-of-unit task gives students the opportunity to answer the essential questions for the unit and to demonstrate their understanding of the unit concepts. The end-of-unit task prompts student thinking, speaking, and writing about unit texts that reflects the demands of the grade-level literacy standards. In addition, the end-of-unit task provides students a chance to demonstrate their understanding in an authentic and meaningful context.

END-OF-UNIT TASK RUBRIC

Third Grade End-of-Unit Task Rubric

Directions**:** After reading and reflecting on the student work sample, score each area and total the rubric score at the bottom of the page. This rubric is designed to look at student work samples in a holistic manner.

	Below Expectation (1)	**Needs More Time (2)**	**Meets Expectation (3)**	**Above Expectation (4)**
Content (Text-based evidence)	-Attempts to address the task, but ideas are unclear. -Lacks supporting details or evidence from the text(s).	-Partially addresses the task. -Includes some supporting details or evidence from the text(s).	-Generally addresses the task. -Includes adequate supporting details or evidence from the text(s).	-Fully addresses all parts of the task. -Includes relevant and sufficient supporting details or evidence from the text(s).
Word Choice (Content Vocabulary)	-Uses little, if any, use of appropriate language.	-Uses inconsistent commend of language.	-Uses adequate command of language.	-Uses consistent command of language.
Mechanics	-Demonstrates little, if any, use of grade-level conventions of standard written English.	-Demonstrates inconsistent command of grade-level conventions of standard written English.	-Generally demonstrates adequate command of grade-level conventions of standard written English.	-Demonstrates consistent command of grade-level conventions of standard written English.
Structure	-Writing is too limited to discern a mode of writing.	-May attempt to utilize a mode of writing.	-Utilizes a mostly consistent mode of writing.	-Utilizes a consistent mode of writing.

Total:_____

Above Expectation: 13 -16 points Meets Expectation: 10-12 points

Needs More Time: 7-9 points Below Expectation: 4-6 points

*Points are not designed to be averaged for a grade.

APPENDIX A: UNIT PREPARATION PROTOCOL

Question 1: What will students learn during my unit?

Review the content goals for the unit and identify the desired results for learners.	
• What are the concepts around which I will organize my unit (*universal concept, unit concept*)? • What will students come to understand through deep exploration of these concepts (*essential questions, enduring understandings*)?* • What disciplinary knowledge will focus instruction and provide the schema for students to organize and anchor new words (*guiding questions, disciplinary understandings*)? • Why is this content important for students to know? *Adapted from McTighe, J. & Seif, E. (2011), Wiggins, G. & McTighe (2013).	

Question 2: How will students demonstrate their learning at the end of my unit?

Review the end-of-unit task and the exemplar response to determine how students will demonstrate their learning.	
• How does the task integrate the grade-level standards for reading, writing, speaking and listening, and/or foundational literacy in service of deep understanding of the unit texts and concepts? • How does the task call for students to synthesize their learning across texts to demonstrate their understanding of the unit concept? • How does the task call for students to use appropriate details and elaborate on their thinking sufficiently? • How does the task prompt student thinking and writing that reflects the grade-level expectations? • What is the criteria for success on this task? What does an excellent response look/sound like?	

Question 3: How will students build knowledge and vocabulary over the course of the unit?

Read each of the texts for the unit and consider how the texts are thoughtfully sequenced to build world and word knowledge.	
• How are the texts sequenced to build knowledge around the unit concepts? • How are the texts sequenced to support students in developing academic and domain-specific vocabulary? • Which instructional strategies are suggested for each text? How will I sequence them within the literacy block?	

Question 4: What makes the text complex?

You are now ready to prepare at the lesson level. To do this, revisit the individual text. Review the text complexity analysis and read the desired understandings for the reading.	
• What aspects of this text (structure, features, meaning/purpose, and knowledge) are the most complex? • What aspects of the text are most critical for students to comprehend to ensure they arrive at the desired understanding(s) for the reading? • Where might you need to spend time and focus students' attention to ensure they comprehend the text?	

Question 5: How will I help students access complex texts during daily instruction?

Review the question sequence and reflect on how the questions support students in accessing the text.	
• How does the question sequence support students in accessing the text and developing the desired understanding(s) of the reading? • How does the question sequence attend to words, phrases, and sentences that will support students in building vocabulary and knowledge? • How are the questions skillfully sequenced to guide students to the desired understanding(s) of the reading? • How will you ensure all students engage with the questions that are most essential to the objectives of the lesson? (Consider structures such as turn and talk, stop and jot, etc.) • How will you consider additional texts, or additional reads of the text, to ensure students fully access and deeply understand the text? • Are there any additional supports (e.g., modeling, re-reading parts of the text) that students will need in order to develop an understanding of the big ideas of the text and the enduring understandings of the unit?	

Question 6: How will students demonstrate their learning during the lesson?

Review the daily task for the lesson to determine what students will be able to do at the end of the lesson.	
• How does the task require students to demonstrate their new or refined understanding? • How does the task call for students to use appropriate details and elaborate on their thinking sufficiently? • How does the task prompt student thinking and writing that reflects the grade-level expectations? • How does this task build on prior learning in the unit/prepare students for success on the end-of-unit task? • How will students demonstrate their learning during other parts of the lesson? • What is the criteria for success on this task? What does an excellent response look/sound like?	

Question 7: What do my students already know, and what are they already able to do?

Consider what your students already know and what they are already able to do to support productive engagement with the resources in the Unit Starter.	
• What knowledge do my students need to have prior to this unit? • What do my students already know? What are they already able to do? • Given this, which/what components of these texts might be challenging? Which/what components of these tasks might be challenging? • What supports will I plan for my students (e.g., shifting to a different level of cognitive demand, adding or adjusting talking structures, adding or adjusting accountable talk stems into student discussions, providing specific academic feedback, or adding or adjusting scaffolded support)? • How can the questions and tasks provided in the Unit Starter inform adjustments to upcoming lessons?	

Question 8: What content do I need to brush up on before teaching this unit?

Determine what knowledge you as the teacher need to build before having students engaged with these resources.	
• What knowledge and understandings about the content do I need to build? • What action steps can I take to develop my knowledge? • What resources and support will I seek out?	

APPENDIX B: LESSON PREPARATION PROTOCOL

Question 1: What will students learn during this lesson?

Review the desired understanding(s) for the reading. Then, read the daily task and the desired student response.	
• What is the desired understanding(s) for this reading? • How does this desired understanding build off what students have already learned? What new understandings will students develop during this reading? • How will my students demonstrate their learning at the end of the lesson? • How does the desired understanding for this reading fit within the larger context of the unit?	

Question 2: How might features of the text help or hold students back from building the disciplinary and/or enduring understandings?

Read and annotate the lesson text and review the associated text complexity analysis.	
• Where in the text will students be asked to make connections to what they already know? Where in the text will students build new knowledge? • What aspects of the text (structure, features, meaning/purpose, knowledge) might help or hold students back from building the disciplinary and/or enduring understandings? • Where do I need to focus students' time and attention during the read aloud/shared reading?	

Question 3: How will I support students in accessing this text, so they can build the disciplinary and/or enduring understandings?

Read through the question sequence and the desired student responses.	
• Which questions are crucial and most aligned to the desired understandings? What thinking will students need to do to answer the most important questions? • Which questions target the aspects of the text that may hold students back from building the desired disciplinary and/or enduring understandings? • Are there adjustments I need to make to the questions or their order to meet the needs of my students while assuring students are still responsible for thinking deeply about the content? • What do I expect to hear in students' responses? How will I support to students who provide partial or incomplete responses in developing a fuller response?	

APPENDIX C: USEFUL PROCEDURAL EXAMPLES FOR EXPLICIT VOCABULARY INSTRUCTION

Example 1:

- Contextualize the word for its role in the text.
- Provide a student-friendly definition, description, explanation, or example of the new term along with a nonlinguistic representation and a gesture.
- Provide additional examples, and ask students to provide their own examples of the word.
- Construct a picture, symbol, or graphic to represent the word.
- Engage students in lively ways to utilize the new word immediately.
- Provide multiple exposures to the word over time.

-Beck et al., 2002; Marzano, 2004

For a specific example, see the shared reading webinar presentation found here.

Example 2:

- Say the word; teach pronunciation.
- Class repeats the word.
- Display the word with a visual, read the word, and say the definition using a complete sentence.
- Have the class say the word and repeat the definition.
- Use the word in a sentence: the context of the sentence should be something students know and can connect with.
- Add a gesture to the definition, and repeat the definition with the gesture.
- Students repeat the definition with the gesture.
- Have student partners take turns teaching the word to each other and using the word in a sentence they create.
- Explain how the word will be used in the text, either by reading the sentence in which it appears or explaining the context in which it appears.

- Adapted from *50 Nifty Speaking and Listening Activities* by Judi Dodson