ENGLISH

K–3 Foundational Skills

GRADE 3
FOUNDATIONAL SKILLS UNIT 6

To the Stars: Lily Explores Space | Reader

EDITION 1

Grade 3 | Foundational Skills 6

To the Stars: Lily Explores Space

Reader

Acknowledgement:

Thank you to all the Texas educators and stakeholders who supported the review process and provided feedback. These materials are the result of the work of numerous individuals, and we are deeply grateful for their contributions.

Notice: These learning resources have been built for Texas students, aligned to the Texas Essential Knowledge and Skills, and are made available pursuant to Chapter 31, Subchapter B-1 of the Texas Education Code.

If you have further product questions or to report an error, please email **openeducationresources@tea.texas.gov**.

Table of Contents

To the Stars: Lily Explores Space

Skills 6 Reader

Chapter

1 Voyage to the Library

Lily loved **gazing** at the night sky. She looked up with her big, bright eyes at the stars above. She wondered what it was like to go to space. Lily thought about an article she had read in a magazine about **astronauts** who work at NASA. They go to work each day and learn the skills they need to travel to space. She wondered about flying in space and what it would be like to see a star up close. She couldn't stop thinking about what else was in space and hoped to one day visit NASA in Houston, Texas, to see real astronauts.

Lily was sitting on her porch one clear summer evening. She gazed at the sky and saw the moon and a few **shimmering** stars. She

didn't know much about space yet, but she knew there was so much to discover out there.

Lily was still thinking about the stars and space when she ate breakfast with her dad the next morning.

"Dad, can you take me to the library?" Lily asked.

"I can't go this morning, but we can go in the afternoon," her dad said.

"Great! Thanks, Dad!"

Lily and her dad went to the library that afternoon. Lily needed help finding the books she was looking for, so she asked the librarian.

"Ms. Lopez, I would like to learn more about space. Can you help me find books about space?" Lily asked.

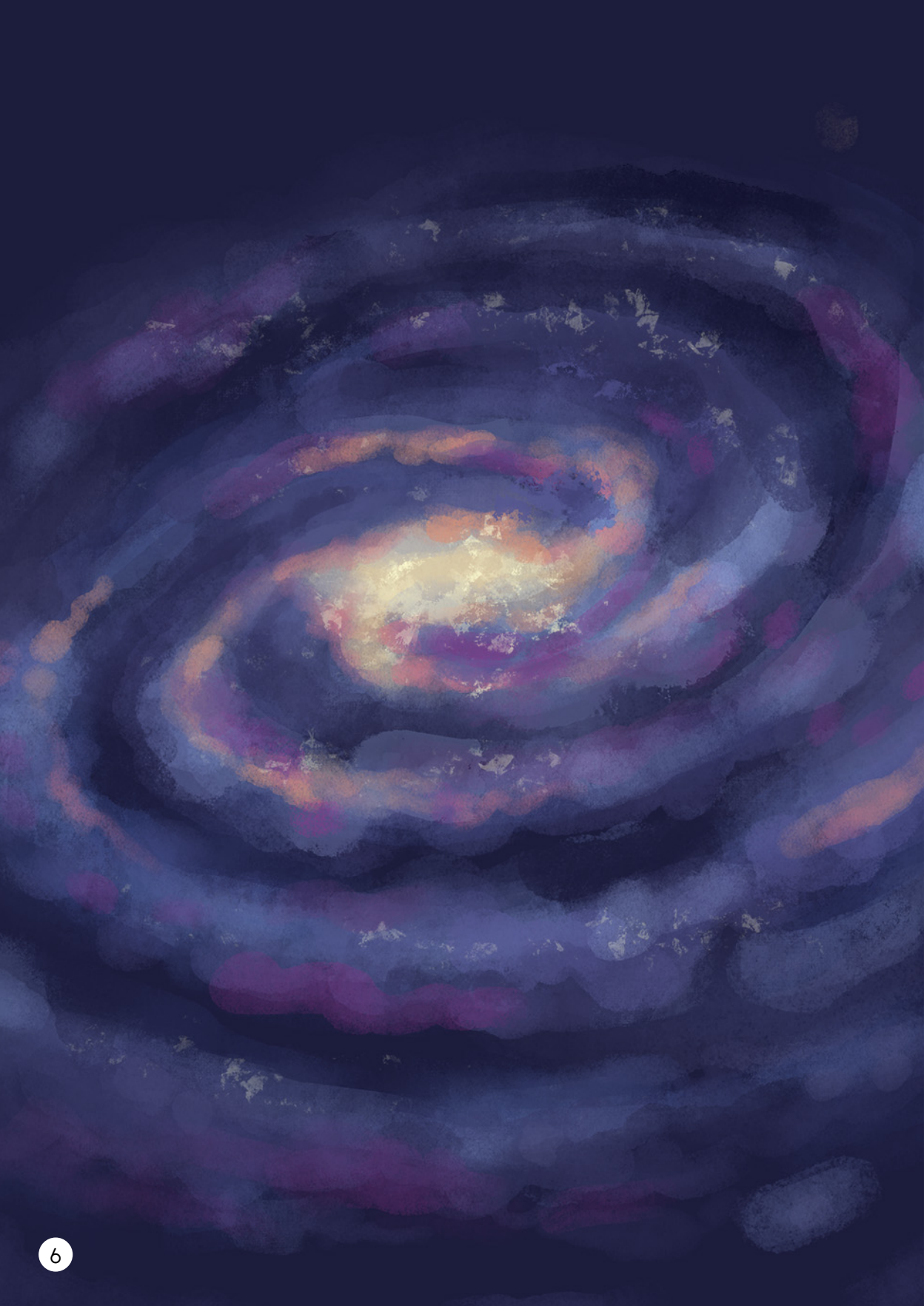
"Sure, Lily. There's an astronomy shelf in the science section. Astronomy is the study of space," Ms. Lopez answered.

Lily found books about the planets, stars, and universe. She learned the universe includes everything, including all living things, dust clouds, galaxies, light, planets, and stars. She picked a book with a cool picture of a **galaxy** on the cover. Lily's excitement grew as she started reading. She learned about the different **constellations**, or groups of stars, seen from Earth. These were the stars that Lily loved to look at each night!

"Look, Dad! There's so much about space to learn! I'm so excited to read these books!" Lily exclaimed.

She learned a group of stars is called a galaxy, and Earth's galaxy is called the Milky Way. The Milky Way contains over 100 billion stars! The Milky Way is like a river of stars in the night sky. It's an **enormous** galaxy, like a big city of stars and planets.

Lily's home, Earth, is one of those planets. She learned that the Milky Way is so massive that it would take a spaceship millions and millions of years to travel from one side to the other. Like Earth's sun, it's full of stars, and many have planets.



Lily told her dad, “When we look up at the night sky, we see a tiny piece of our amazing Milky Way galaxy!”

Lily also learned about Earth’s corner of the Milky Way. She read about the solar system and the planets that orbit the sun. She read about the sun, the star that lights up our world. It’s a gigantic ball of hot, glowing gas. It provides the light and warmth that allows life to thrive on Earth.

Lily marveled at the sun’s power. She explained to her dad that the sun is like a giant, super-bright light bulb in the sky. This light bulb is bright because it contains very hot gasses.

Lily learned the sun is the source of energy for everything on Earth. Without the sun, people wouldn’t have the food, light, and warmth they need to live and grow.

The sunlight makes it warm on Earth, like a cozy blanket. This warmth is essential because it helps support life.

Plants, like the ones in a garden or the trees in a park, use this sunlight to make their food through **photosynthesis**.

When animals, including people, eat plants, they get the energy from the sun's light that the plants store. They indirectly eat the sun's energy through the plants.

Lily exclaimed, "The sun is like our biggest, most important friend in the sky!"

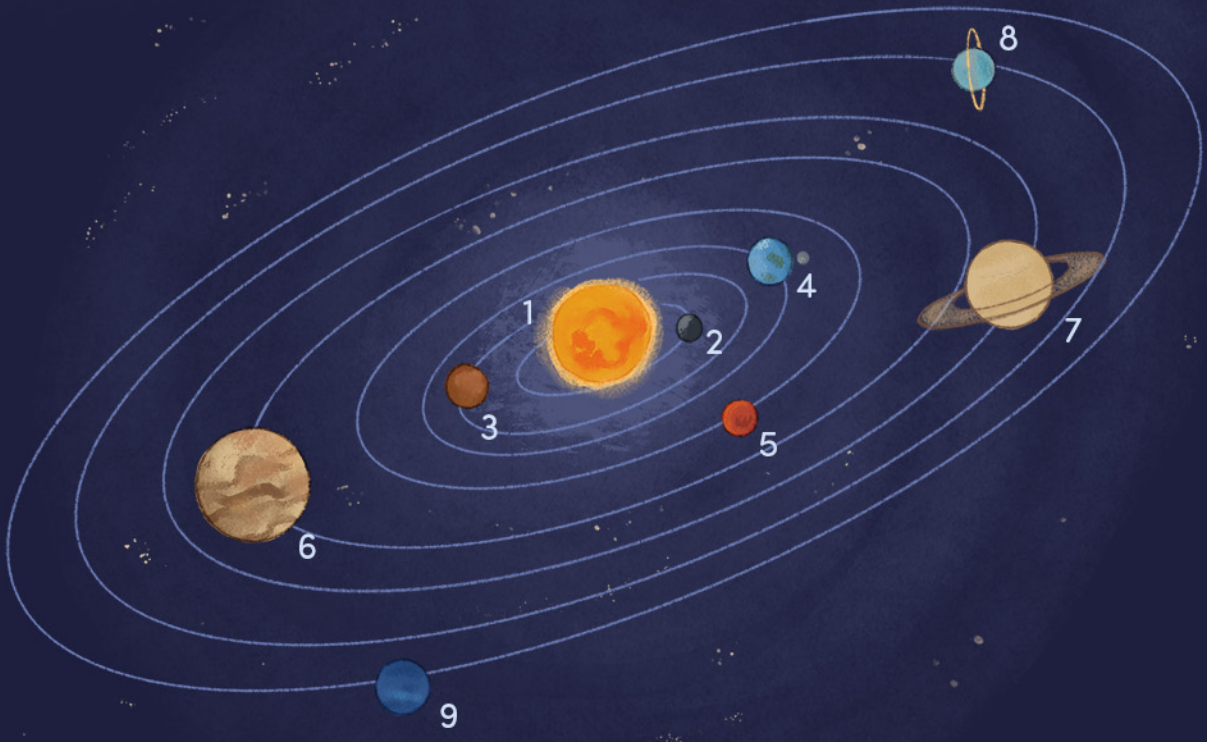
Chapter

2 Orbiting the Sun

Lily continued to visit the library to learn more about space. Her dad brought her three weekends in a row!

Lily learned that the sun is like the big star in the center of a cosmic dance floor, and planets in the solar system move through space like dancers. The "dancers" twirl while moving around the sun. Each planet has a path called an orbit. They're like toy hoops in space. These hoops keep the planets from getting too close to or far from the sun. The closer a planet is to the sun, the faster it has to dance to stay in **orbit**. It's like a game of musical chairs, but, instead of chairs, there are orbits.

The music is the sun's gravity pulling the planets closer while they twirl around to find their perfect spot. This fantastic dance keeps the solar system in perfect **harmony**.



1. The Sun
2. Mercury
3. Venus
4. Earth
5. Mars
6. Jupiter
7. Saturn
8. Uranus
9. Neptune

The moon orbits around Earth as the planets orbit the sun. Lily thought of the moon as Earth's friend. The moon takes a path in the sky like a stretched-out, oval-shaped loop. The moon is closer to Earth sometimes, and other times, it's a bit farther away. It takes the moon about 27 days to finish going around the Earth. **Gravity** keeps the moon moving around the Earth. It's like the string that keeps a kite from flying away. The moon's gravity also pulls on the Earth, causing the water to shift and create low and high tides.

The amount of the moon that is visible from Earth changes during its orbit. The moon sometimes looks like a bright round plate in the sky, and other times, it's just a **sliver**. This is because the sun's light shines on it from different angles. This causes the different phases of the moon. If the sun did not shine its light on the moon from different angles, then the moon would always look the same.


Last Quarter
Waning Crescent
Waning Gibbous
New Moon
Full Moon
Waxing Crescent
Waxing Gibbous
First Quarter

Ms. Lopez helped Lily learn about many of the planets in the solar system. She learned Earth is the third planet from the sun in the solar system.

Lily also learned that Mercury is the closest planet to the sun. It has **scorching** days and freezing nights. Venus is sometimes called Earth's "sister planet" because it's similar to Earth in size. It is the hottest planet in the solar system, rotates backward, and has no moons. Mars is the Red Planet because it looks red. It has the largest volcano in the solar system, and there is some water there! Jupiter is the largest planet in the solar system. It features a giant, swirling storm called the Great Red Spot.

Lily also learned about her favorite planet, Saturn. Saturn is known for its unique rings, and it has more than 80 moons.

"You're becoming an expert on space, Lily! I'll bet you'll know more than me soon," said Ms. Lopez.

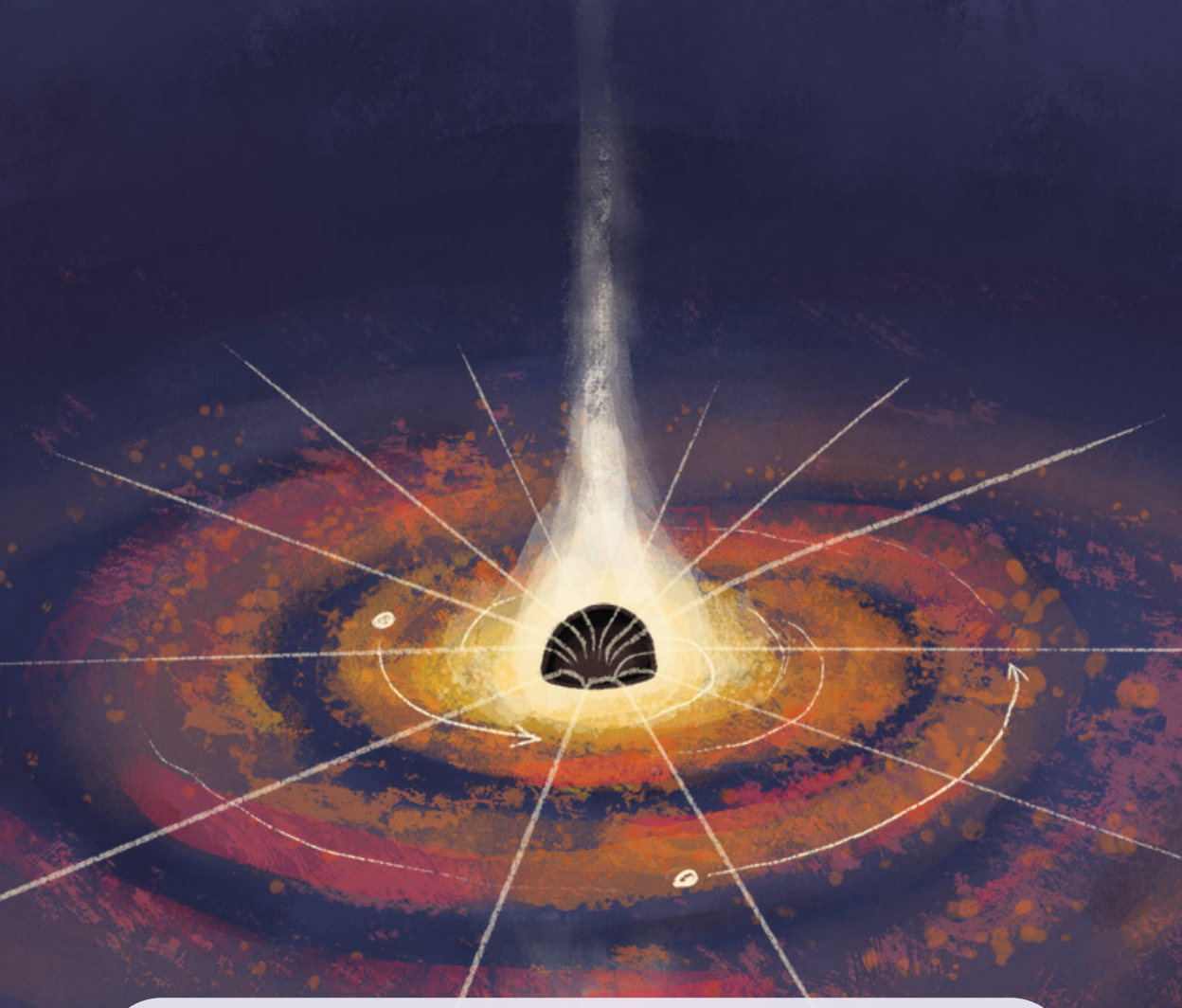
"You're such a help, Ms. Lopez. I'd be lost without you!" exclaimed Lily.

Chapter

3 Black Holes

Lily didn't just learn about Earth's galaxy. She also learned about nebulae, clouds of gas and dust in space. Some **nebulae** are so long and thin, they look like cables or flexible objects.

Lily also read about how a star begins, and how, in the end, it turns into a **black hole**. A black hole is a place in space where gravity pulls so much that even light can't get out. When objects get too close to a black hole, they stretch out really long and thin, like spaghetti! A single black hole can be billions of times larger than the Earth's sun. This process takes a long time and only happens to really big stars. A star has to be at least 20 times bigger than the sun to turn into a black hole!



"Wow," thought Lily. "What would it be like to be in a black hole? I bet my friends don't know about black holes. They'll be so surprised!"

Lily started to wonder how people knew so much about space. How did scientists discover black holes? How do they know what they're like?

Lily went back to Ms. Lopez to ask another question. She asked, "How do scientists study black holes?"

Ms. Lopez found a book from the Space Center in Houston all about black holes. She pointed to the book's table of contents. Ms. Lopez found a section all about how scientists study black holes. Black holes do not give off any light, so scientists struggle to observe them directly. According to the book, the NASA scientists use powerful **telescopes** to discover the mysteries of black holes. Using a telescope enables them to look at how the black holes affect nearby objects. They look at what the black holes do to nearby objects instead. For example, if they find stars orbiting an invisible object, that object is

probably a black hole. Scientists measure these stars' orbits so they can figure out how big the black hole is. The only way scientists know that black holes exist is to observe their effects on light and other objects.

Lily borrowed some books from the library to continue reading about space and headed home.

Lily asked her dad and her brother, Ted, to act out the planets orbiting around the sun.

"We'll dance like the planets orbiting around the sun!" Lily laughed.

"Don't fall down!" exclaimed her dad when Ted got dizzy.

"You better catch me if I fall!" cried Ted.

Lily said, "We aren't done yet! Let's pretend Ted is a black hole!" Lily and Dad moved toward her brother like gravity was pulling them. They giggled together as Ted tried to wiggle away.

Chapter

4 Comets

Lily continued her space education. She was surprised to learn comets are amazing icy objects from far away in the solar system. They have bright, glowing heads like big, icy balls. Comets have long, glowing tails that can be seen in the night sky when they get close to the sun. Up close, comets look like dirty snowballs flying through space, but the trickle of dust and gas from their tails creates a beautiful sight. Comets can get bright and shiny when they get closer to the sun. Comets can have different colors, from white to blue or even green, like cosmic fireworks.

Lily hoped to see a comet sparkle and twinkle like a star in the night sky someday.

People like Lily have been interested in space throughout history. A scientist who studies space is called an **astronomer**. Studying comets helps astronomers understand the solar system. They work hard to find patterns in how comets and other objects journey through space.

Lily learned about one astronomer named Maria Mitchell. Maria Mitchell was the first woman to be an astronomer in the United States. One night in 1847, she was looking through her telescope on the roof of her father's house. Looking for comets became the focal point of her stargazing. She saw something unusual in the sky. She observed it carefully. She realized it was a brand-new comet! Her discovery was a big deal. Comets are rare and not easy to find. They named the comet "Miss Mitchell's Comet" in her honor. People celebrated her locally and far from home. She even won a gold medal from

the King of Denmark for her **remarkable** achievement. Maria Mitchell's keen eye and love for the stars led her to this incredible discovery. She was an inspiration to young scientists like Lily.

Chapter 5

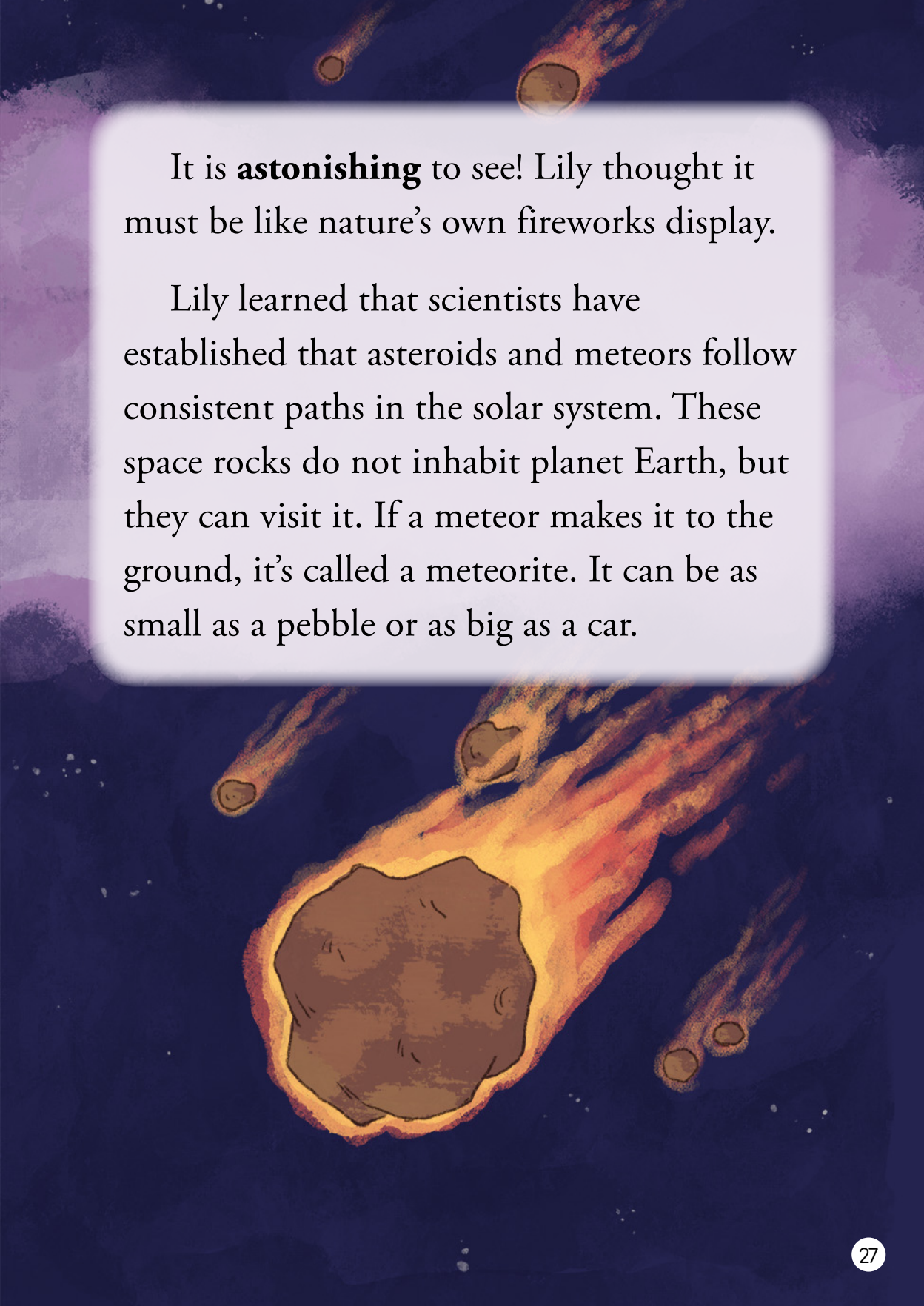
Meteors and Asteroids

Lily was excited to learn about **asteroids** and **meteors**, fantastic objects that zoom through space. Asteroids are like space rocks that orbit the sun. Some are big. Some are small. Some asteroids are tiny, like pebbles, while others are as big as mountains. Asteroids can have all kinds of shapes, like big space potatoes or strange space diamonds.

Meteors are smaller pieces of asteroids that enter Earth's **atmosphere**. The word *meteor* comes from the Greek meteōros, meaning "high in the air." The atmosphere is a layer of gas that surrounds Earth. When several meteors burn up, they create streaks of light in the sky called meteor showers.

It is **astonishing** to see! Lily thought it must be like nature's own fireworks display.

Lily learned that scientists have established that asteroids and meteors follow consistent paths in the solar system. These space rocks do not inhabit planet Earth, but they can visit it. If a meteor makes it to the ground, it's called a meteorite. It can be as small as a pebble or as big as a car.



All the objects flying through space **enchanted** Lily. Asteroids, comets, and meteors were marvelous!

Lily soon realized she needed a telescope to see the comets, planets, and stars up close. She saved her allowance and, with the help of her parents, got a small telescope. She set it up in her backyard and started exploring the night sky. Her favorite time was when her dad joined her. They spent hours together, stargazing and talking about the mysteries of the universe.

"Look up there," said Lily's dad. "Those stars are so bright!"

"I wish I could see a comet, Dad." Lily lamented.

"Just keep looking! There are so many wonderful things to see up there. Like Maria Mitchell, you may also spot a comet flying through the sky."

"You're right, Dad. I love being out here looking at the stars with you."

Chapter

6 Space Club

Lily wanted to share her love of space with her friends at school. Her friend Max suggested they start a Space Club.

The Space Club members decided to learn more about space together.

Anita brought in a book about space missions. Anita said, "It's like an incredible adventure when you journey beyond Earth's atmosphere and see the wonders of space."

Max **pondered** what it was like to go on a space mission. He thought about how astronauts would need to think creatively to solve problems in space.

Their friend David was amazed by the wonders of space, such as the beginning of stars and the dance of planets and galaxies.

Zara thought about the multiple scientists who help on space missions. These scientists have to work together to tackle critical questions.

Lily brought her new telescope to the Space Club.

"This is my telescope," Lily said. "My dad and I use it to see things far away, like the stars."

"How does it work?" asked Anita.

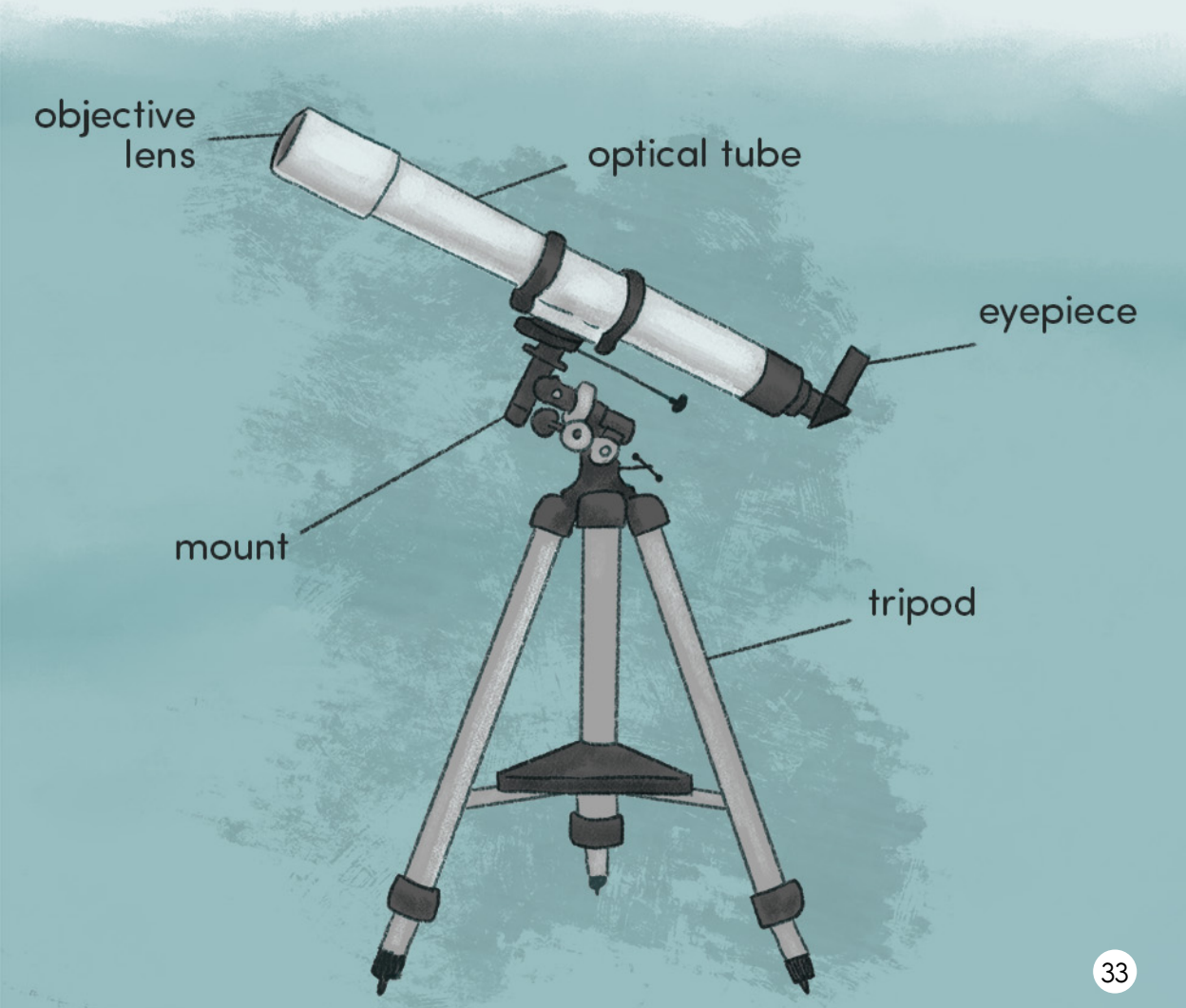
Lily replied, "It's really neat, but it's actually science! A telescope has two main parts. The big lens in the front is called the **objective lens**. The smaller lens in the back is called the **eyepiece**."

Lily explained, "The objective lens collects lots of light from the thing you're looking at, like the moon, a star, or a planet. It bends that light and brings it all together at one point."

Max asked, "What happens next?"

"That's where the eyepiece comes in! The eyepiece is like a tiny magnifying glass. It takes all the light that the big lens has collected and makes it even bigger, so it looks like the thing you're looking at is closer than it is."

Anita exclaimed, "Oh, I get it! So, the telescope helps us see things bigger and closer."



Lily replied, “Exactly! And that’s how we can explore the night sky and see all the amazing objects in space. Telescopes are like our super cool space binoculars!”

Lily also explained that large space telescopes have tentacle-like instruments that capture light particles to reveal distant objects in space. Those telescopes are more than four times as powerful as hers!

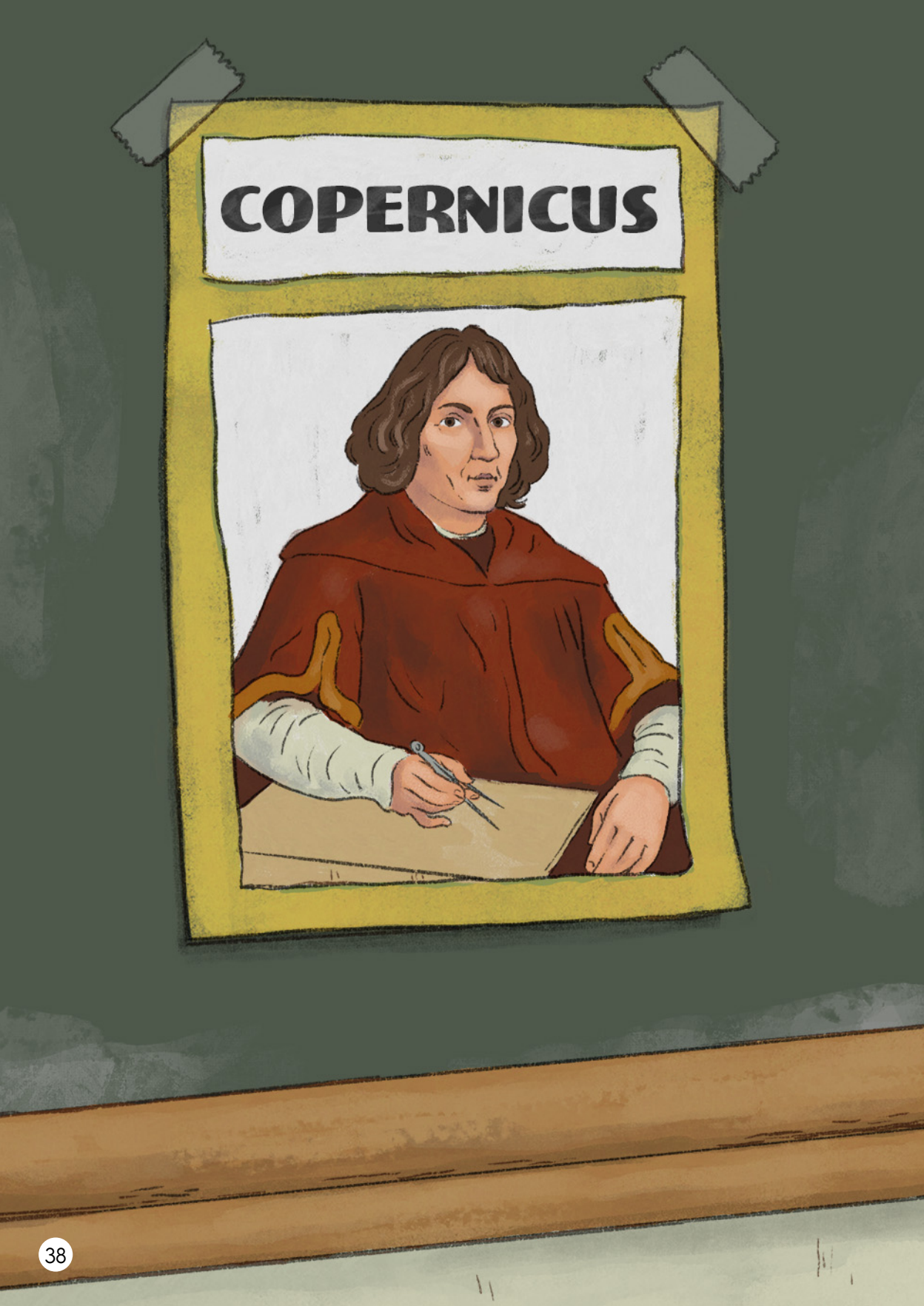
Chapter

7 Astronomers

Lily and the Space Club also learned more about astronomers. Astronomers use powerful telescopes to see **distant** galaxies. It's a joyful job for astronomers because they get to explore the wonderful and vast universe. Astronomers watch for changes in the sky, always hoping to make meaningful discoveries.

Lily and the Space Club also learned about other famous astronomers and their incredible accomplishments. Members of the Space Club made presentations about an astronomer they researched.


HERSCHEL
SAGAN
COPERNICUS
KEPLER
HUBBLE

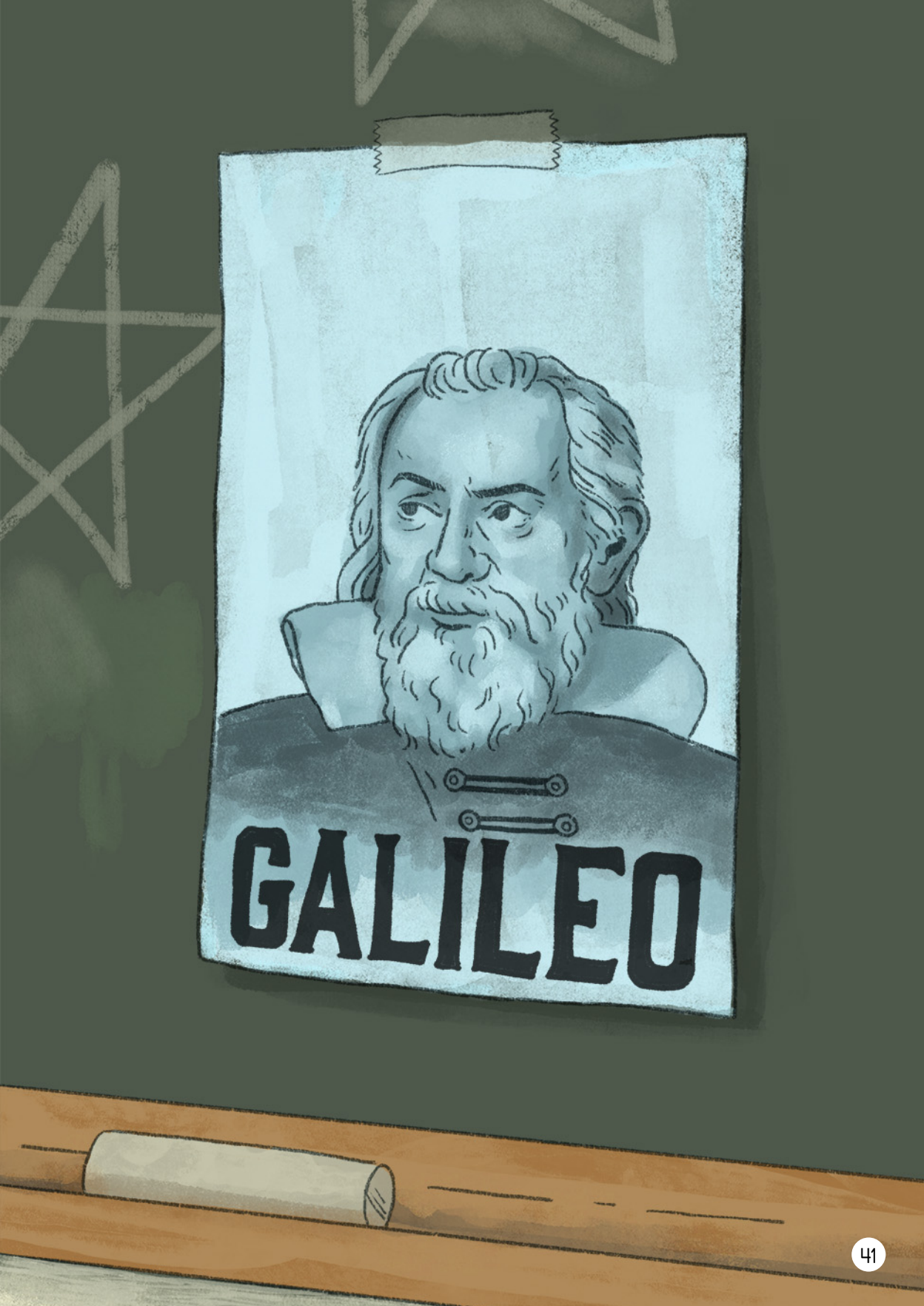

COPERNICUS

Zara started, “I’ll tell about Copernicus.”

She explained that Nicolaus Copernicus had been a Polish astronomer. People used to believe that the sun orbited the Earth. He believed the universe is heliocentric, meaning the Earth goes around the sun. This idea helped people see the universe in a new way. Copernicus increased our knowledge about Earth and the stars and is well remembered in the history of science.

David explained that Galileo Galilei built upon Copernicus's ideas. Galileo was an incredibly successful scientist. One of his big accomplishments was improving the use of the telescope to look at the night sky. He was careful in his observations and discovered craters on the moon and four of Jupiter's moons. His discoveries confirmed Copernicus's **theory** that Earth was not the center of the universe but orbited around the sun. Galileo's discoveries helped people understand the universe better, and he is often called the "father of modern science."

Learning about these astronomers showed the Space Club that scientists could make a limitless number of discoveries about space. The universe is so enormous and full of wonders. Astronomers are fearless in their search for knowledge and can always find more.


GALILEO

Chapter

8 Astronauts

Lily and the Space Club also learned about famous astronauts and their incredible **accomplishments**. It takes a lot of planning and training to be an astronaut, beginning with their education. Astronauts need to know a lot about engineering, science, and math. They may learn to speak other languages to talk with astronauts from other countries. They have to be good at teamwork and problem-solving. Astronauts work inside and outside of the spaceship. Inside, they do science **experiments**. Outside, they go on spacewalks. During a spacewalk on the moon, astronauts discovered they could hop very high due to low gravity!


SHEPARD
COLLINS
RIDE
ARMSTRONG
+ ALDRIN
GLENN
LAIKA
HADFIELD

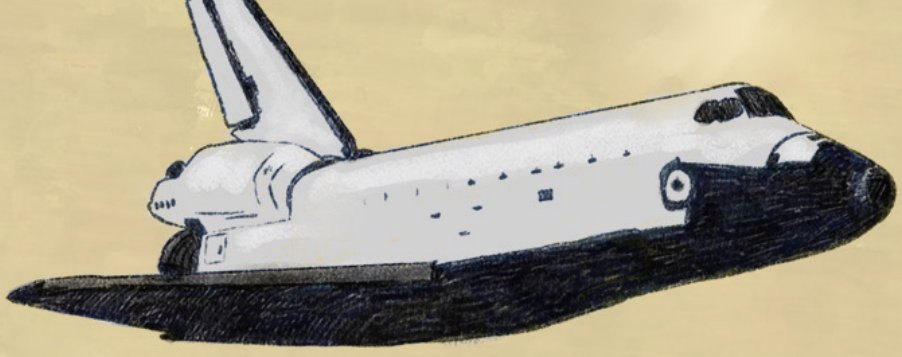
Max described Neil Armstrong's life and accomplishments. Max exclaimed, "He was the first person to walk on the moon!"

On July 20, 1969, Neil Armstrong stepped out of the Apollo 11 spacecraft on the moon. He said, "That's one small step for [a] man, one giant leap for mankind." David explained that this was very meaningful. It showed that humans could explore places far from Earth. Neil Armstrong's incredible journey has inspired many kids to dream big about exploring space.

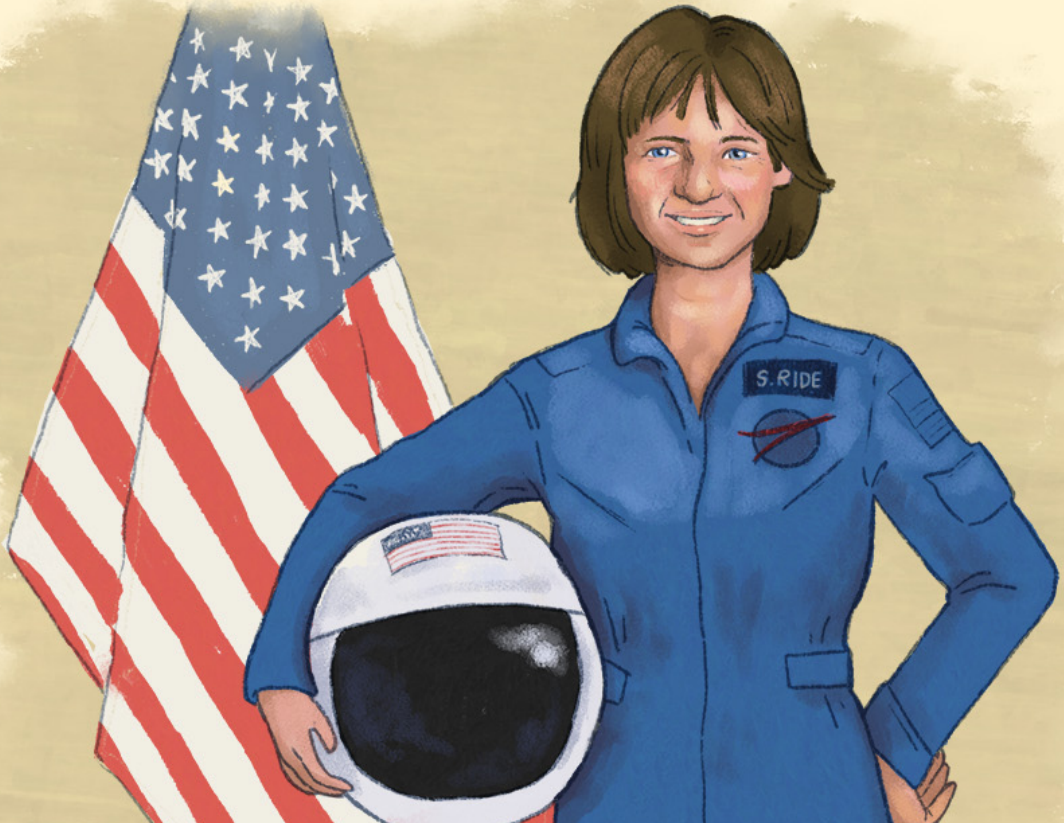
Anita explained how Sally Ride became the first American woman to travel to space in 1983. Sally Ride made history when she flew on the space shuttle *Challenger*. But that was only the beginning. She also studied how to prevent accidents in space.

"She makes me want to be an astronaut, too," said Anita.

The Space Club learned that Sally Ride didn't stop there. She returned to space again and was later inducted into the National Women's Hall of Fame. She worked hard to inspire young people to reach for the stars. She showed that anyone can become an astronaut and explore the universe.



Astronauts and astronomers both explore space. Astronomers may not travel into space, but they add to the understanding of the universe, and their knowledge makes it possible for astronauts to travel into space. Astronauts and astronomers work together to make the biggest discoveries!

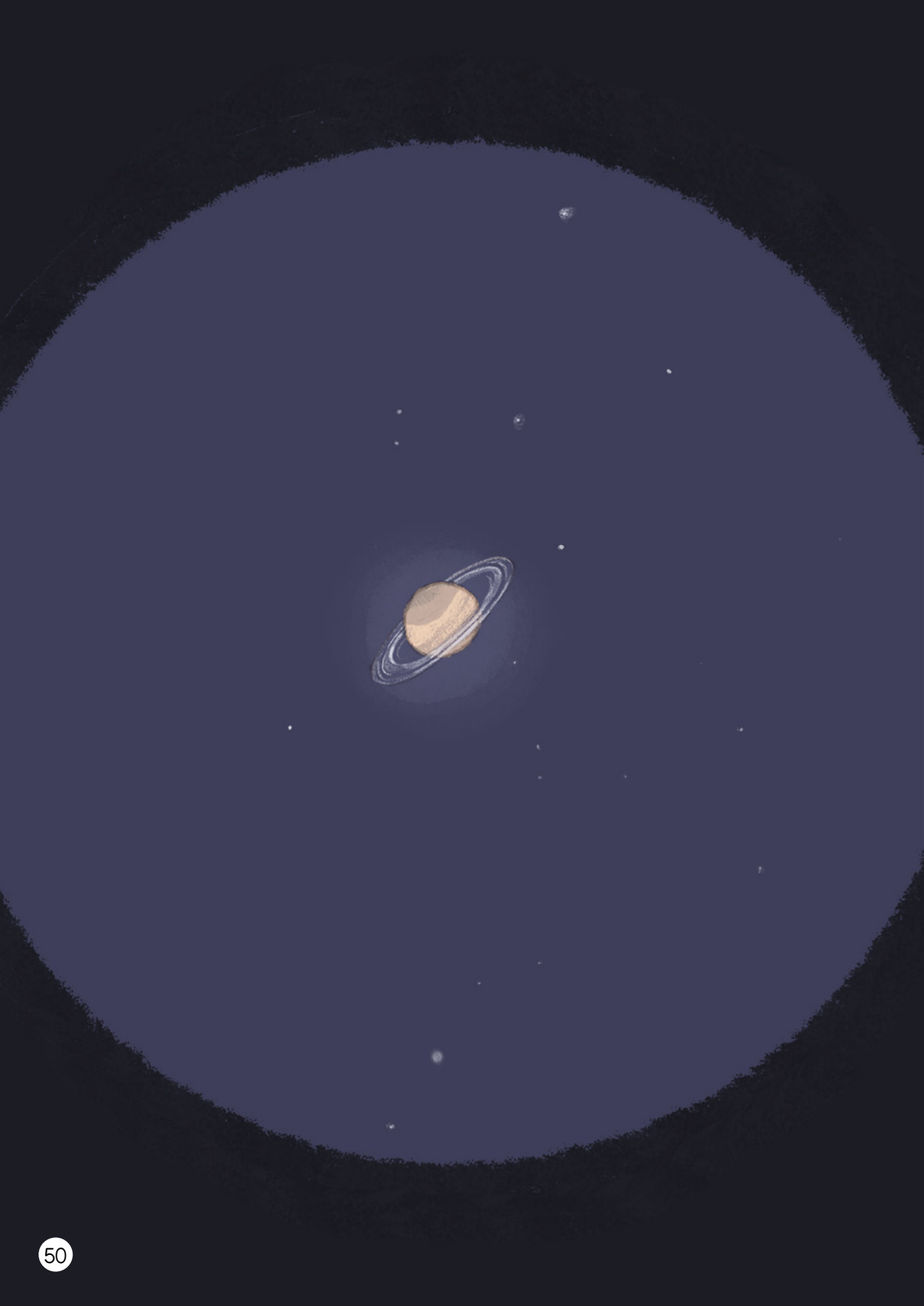


Chapter

9 Stargazing

The Space Club loved learning about many impressive astronomers and astronauts, but they were eager to see the stars and planets up close. They decided to plan a stargazing night at school.

Lily and her friends carried the telescope onto the school's lawn. Many parents and kids from the town came to join them. Members of the Space Club gave a short talk about the stars, planets, and constellations. They passed out copies of maps of stars, and they all took turns looking through the telescope.



Lily pointed her telescope toward Saturn. She spied the planet and invited everyone to have a look. Everyone loved the **gas giant** with its beautiful rings. Lily happily explained what she knew about the planet and its **stunning** rings.

Lily and her friends shared stories about the asteroids, comets, meteors, planets, and stars they had read about as the night continued. They applied everything they learned in the Space Club and felt like astronauts on a grand adventure. They were exploring the vast universe right from their small town.

Anita spotted Venus. David showed everyone how to adjust the telescope. Zara pointed out different constellations. It was a lot of fun.

When Lily saw a meteor blazing across the sky, she excitedly cried, “Look, it’s a shooting star! I mean, it’s a meteor!” Lily had never been happier.

Lily knew that the night sky held endless mysteries. She was excited to keep learning about the wonders of astronomy. Her journey among the stars had just begun. She knew there was so much more to explore in the vast universe.

Under the glittering stars and the moon’s soft glow, Lily’s love for astronomy continued to shine. She dreamed of exploring distant galaxies. She also hoped to follow in the footsteps of famous astronomers and astronauts. This was just the beginning of her space story.

Chapter 10 Looking to the Stars

The club members kept thinking about their incredible stargazing adventure at the next Space Club meeting. They thought about all the asteroids, **comets**, galaxies, planets, and stars.

Lily shared her plan to become an astronomer when she grew up. She wanted to spend her life understanding everything about space. Lily was a big dreamer, but she was also a careful planner. Lily studied what she would have to do to be an astronomer. She planned to visit a large space telescope to understand what being an astronomer was like.

Anita said, “I’ll be an astronaut!” She wanted to see the moon (and maybe Mars) for herself. She applied to go to a special space camp for kids. She was hoping to go this summer.

David wanted to build **space shuttles**. He loved taking things apart to see how they worked and putting them back together. Building space shuttles would be like a great big puzzle!

Max was interested in working at NASA (National Aeronautics and Space Administration) in the space program. He wanted to do the planning to make sure space **missions** succeeded. Max wanted to be in the action when a spaceship took off!

Zara said she wanted to write a book about space to help other kids learn about space. She was a great artist. She wanted to use her skills as an artist to create dazzling pictures of space.

Lily was happy that her friends all found space as interesting as she did. She knew there was so much more to explore and was excited to keep looking to the stars.

Glossary

A

accomplishment (uh-KAAM-pluhsh-muhnt): an impressive thing that is done or achieved after a lot of work

asteroids (AS-tuh-roids): rocks that orbit, or travel around, the sun

astonishing (uh-STAH-nuh-shuhng): extremely surprising or impressive

astronaut (AS-truh-nawt): someone who has been trained to travel to space

astronomer (uh-STRAH-nuh-mer): a scientist who studies outer space, including the sun, moon, stars, and planets

atmosphere (AT-muh-sfeer): the mixture of gasses around the earth or other objects in space

B

black hole (BLAK HOHL): an area in space with gravity so strong that nothing, including light, can escape it

C

constellations (kon-stuh-LEY-shuhn): groups of stars in the sky that form a shape and have a name, often a name that describes what the shape looks like

comets (KAH-muhts): celestial objects made up of ice, dust, and rocks that orbit the sun

D

distant (DI·stent): far away; not close or near

E

enchanted (uhn-CHAN-tuhd): filled with delight; having or seeming to have a magical quality

enormous (i-NOR-muhs): extremely large

experiment (ik-SPAIR-uh-muhnt): a scientific test that is done in order to study what happens and to gain new knowledge

eyepiece (AHY-pees): the glass part of a telescope that makes the image the telescope is focused on appear larger and nearer

G

galaxy (GAL-uhk-see): a collection of billions of stars and other matter in outer space that are held together by gravity

gas giant (GAS JAI-uhnt): a large planet made mostly of gasses, like hydrogen and helium

gazing (GAY-zing): to look at something or somebody closely for a long time because you are interested in or curious about it

gravity (GRAV-i-tee): an invisible force that pulls objects toward each other, regardless of whether they touch

H

harmony (HAHR-muh-nee): a combination of related things working together smoothly

M

meteors (MEE-tee-ors): bright streaks or flashes in the sky caused by small pieces of space material entering the atmosphere and burning up

meteorite (MEE-tee-uh-ryt): a piece of rock from outer space that has landed on Earth

mission (MISH-en): an important job or task

N

nebulae (NEB-yuh-lee): clouds of dust or gas found between the stars

O

orbit (AWR-bit): a path in space that one object takes around another

P

photosynthesis (foh-toh-SIN-thuh-sis): the process by which a green plant uses sunlight to make food for itself

pondered (PON-derd): to think about something carefully and deeply

R

remarkable (ri-MAHR-kuh-buhl): worth mentioning; likely to be noticed

S

scorching (SKAWR-ching): extremely hot to the touch

shimmering (SHIM-uhr-ring): shining with a soft light

sliver (SLIV-er): a small or thin shape that is a part from a larger piece

space shuttle (spays SHUT-uhl): a spacecraft that is used to transport astronauts and cargo to and from space

stunning (stuh-nuhng): extremely impressive or attractive

T

telescope (TEL-uh-skohp): a tube-shaped instrument that uses powerful lenses to make faraway objects appear larger and closer

theory (THEE-uh-ree): an educated guess, explanation, or idea that tries to make sense of something based on observations, evidence, and reasoning

About this Book

This book has been created for use by students learning to read with the program. Readability levels are suitable for early readers. The book has also been carefully leveled in terms of its "code load," or the number of spellings used in the stories.

The English writing system is complex. It uses more than 200 spellings to stand for 40-odd sounds. Many sounds can be spelled several different ways, and many spellings can be pronounced several different ways. This book has been designed to make early reading experiences simpler and more productive by using a subset of the available spellings. It uses *only* spellings students have been taught to sound out as part of their phonics lessons, plus a handful of Tricky Words, which have also been deliberately introduced in the lessons. This means the stories will be 100% decodable if they are assigned at the proper time.

As the students move through the program, they learn new spellings, and the "code load" in the decodable Readers increases gradually. The code load graphic on this page indicates the number of spellings students are expected to know in order to read the first story of the book and the number of spellings students are expected to know in order to read the final stories in the book. The columns on the opposite page list the specific spellings and Tricky Words students are expected to recognize at the beginning of this Reader. The bullets at the bottom of the opposite page identify spellings, Tricky Words, and other topics that are introduced gradually in the unit this Reader accompanies.

TRICKY WORDS:

beautiful, diamond, done, journeys, knowledge, spaghetti, suggested, thought, through

Code knowledge added gradually in the unit for this Reader:

- Decoding and forming contractions
- Decoding and spelling multisyllabic words with consonant +*le* syllables
- Decoding words with suffixes -*ful* and -*less*
- Decoding words with suffixes that change the base word by dropping final 'e', doubling the final consonant, or changing the "y" to "i"

ISBN 979-8-89072-039-9

Printed in the USA