Teacher Notes

Themes

- Outer space
- Meteorites
- Science skills – questioning and researching

Key learning outcomes

- Identify different objects that are in outer space.
- Explore how Earth is part of space and we interact with objects in space.
- Question, research and communicate ideas about Earth and space.

Key curriculum areas

- **Science:** Science Understanding (Physical sciences, Earth and space sciences); Science Inquiry
- **English:** Language; Literacy
- **HASS:** Skills (Questioning and researching)

Publication details

Lucky's Star: The Story of a Meteorite

ISBN: 9781486318070

Teacher notes prepared by Jillian Brooks.

CSIRO Publishing
Private Bag 10
Clayton South, VIC 3169, Australia

Website: www.publish.csiro.au
Tel: 1300 788 000 (local call in Australia)
Email: publishing.sales@csiro.au

Lucky's Star: The Story of a Meteorite

Mark Greenwood and Lucia Masciullo

About the book

On a quiet spring morning, something strange falls from the sky and lands on a small country town. Lucky watches as 'stars' rain down on the fields and farms, but just what are these unusual objects? And what will Lucky do with her own special find?

Lucky's Star explores the fascinating true story of the Murchison meteorite. The pieces of space rock that were discovered in Murchison, Victoria, provided clues about the origins of life on Earth. Fragments from the meteorite contain the oldest material ever found – stardust!

Recommended for

Readers aged 5 to 9 (Years 1 to 4)

CSIRO PUBLISHING

Teacher Notes

About the author and illustrator

Mark Greenwood is a history hunter. His award-winning books examining history and multicultural themes have been published and honoured internationally. See www.markgreenwood.com.au

Lucia Masciullo is an award-winning illustrator who loves to create whimsical characters using traditional techniques. Born and raised in Italy, she studied biology before moving to Australia where she pursued her passion for art. See https://luciamasciullo.com/

Pre-reading questions or activities

What are some things you know about space? (Create a mind map with the class about what they already understand about space.) *Planets, stars, moons, the Sun, asteroids, meteorites, stardust, galaxies, the Universe, etc.*

Where do we live? (Use the worksheet on pages 6 and 7 to support this activity.)
Earth is one of many objects that are moving around space. Discuss with students that we live in the Universe, which is broken down into galaxies. Our galaxy is called the Milky Way. Galaxies are broken down into solar systems. A solar system is usually made up of one star with planets that go around that star. In our solar system, we live on planet Earth and we call our star the Sun.

Copy the worksheet for students and ask them to write these phrases in the correct circles:

The Universe.
The Milky Way is our galaxy.
In our solar system the star we move around is called the Sun.
Earth is the planet we live on.

Discussion questions

Science

1. On page 7 there is a loud 'Ba-BOOM!' sound, and something is falling from the sky. Predict what you think it is.
2. What are some questions scientists might ask when they are researching a rock from outer space? *What is it made of? How old is it? Where did it come from? Are there any signs of life on the rock?*

3. Why is it that we can see stars at night and not in the daytime? *Stars are balls of burning gases that let off a huge amount of light and heat. In the daytime the Sun (the star closest to us) is so bright that it is the only star we can see, and other stars farther away cannot be seen as their light is mixed in with the Sun's light. However, when it is nighttime, Earth is turned away from the Sun and then we get to see the light from all the other stars.*
4. Why is the kite not able to take the rock into outer space? *The kite does not have enough lift power to overcome gravity (unlike a space rocket). The rock is too heavy.*

English

1. Why is there an apostrophe in 'Lucky's Star'? (Years 3 and 4) *The star belongs to Lucky.*
2. How do we read aloud 'Ba-BOOM!' on page 7? *The exclamation mark and larger font size indicate that it should be spoken loudly. The author wants it spoken loudly because it implies a loud bang has been heard by all the characters in the book.*
3. On page 14, many adjectives have been used to describe the rock. What are the adjectives that have been used? *Smooth, shallow, chipped, dusted, star-white. Flecks is also an impressive noun used to describe what was on the rock.*

HASS

1. Have you been to a museum? What is the purpose of a museum? *For example, to show people all the wonderful things about Earth and the Universe.*

Activities

Science

Making a kite

In the book, Lucky tries to get the rock back into space using a kite. Let's make a kite and see if it will carry a small rock.

SAFETY: Be careful when using scissors to cut the newspaper, or ask an adult for help.

Things you will need:

- 6 sticks (these can be sticks found on the ground or bought pieces of wood such as skewers)
- Reusable adhesive (e.g. Blu Tack)
- Newspaper
- Scissors
- Sticky tape
- String
- 5–10 pieces of cloth, rags or coloured tissue paper
- Small rock

What to do:

1. Take the longest stick and cross it over one of the other sticks, then secure them with reusable adhesive so that a cross is made.
2. With the other four sticks, complete the kite shape around the cross: break sticks to the correct size and secure them with reusable adhesive.
3. Using scissors, cut the newspaper to match the outline of the kite. Then attach the newspaper to the kite using sticky tape.
4. Tie a long piece of string to the middle of the cross and a shorter piece of string to the end of the kite (for the tail).
5. Tie the pieces of cloth, rags or tissue paper to the tail string to make bow-like shapes.
6. Attach the small rock to the cross in the middle of the kite with sticky tape.
7. Take the kite outside and see if it will fly. This will work better on a windy day, but fast running should also get the kite airborne.

Discuss with students why kites can fly. *The air underneath the kite pushes the paper on the kite up. If the air underneath is stronger than the weight of the kite, then the kite will fly. Weight is mass times gravity.*

Research (Years 3 and 4)

Lucky found a meteorite and then researched some of the mysteries of the Universe. Now it is your turn. Below are some useful websites on different objects in space. As a class or in groups, find some fascinating facts about the Universe.

- NASA Space Place: https://spaceplace.nasa.gov/
- Meteorites: https://spaceplace.nasa.gov/asteroid-or-meteor/en/
- Asteroids: https://spaceplace.nasa.gov/asteroid/en/
- Meteor shower: https://spaceplace.nasa.gov/meteor-shower/en/
- Comets: https://spaceplace.nasa.gov/comets/en/

Jobs in space science (Years 3 and 4)

In the book, a professor led a team of scientists to study the Murchison meteorite. What kinds of scientists do you think were in that team?

Teachers can use the website https://au.indeed.com/career-advice/finding-a-job/careers-in-space-science to help guide students through the different types of jobs that people can do within the space sciences, then use the worksheet on page 9 to fill in with the class what each job does. *Astrophysicist, Astronomer, Aerospace Engineer, Engineering Technician, PR and Communications Specialist, Meteorologist, Atmospheric Scientist, Research Assistant and Geologist*.

Then discuss which of these people would have turned up at the dairy. Is there a job that sounds interesting to you?

English

Descriptive language

In this book, the author uses a number of adjectives and descriptive tools to describe the rock. Go outside and find something interesting to describe. This could be a rock, a leaf, a flower, etc.

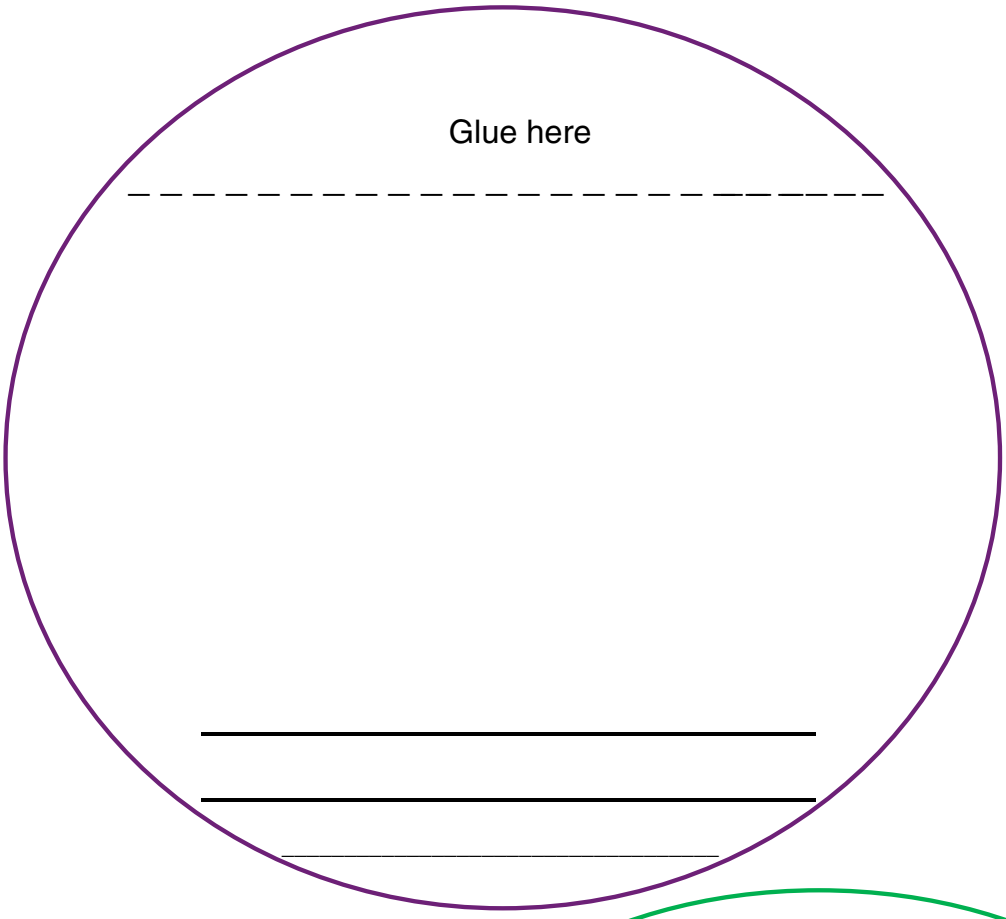
Use page 14 in the book as a mentor text to support students to write a descriptive paragraph about their object. Students should create a list of words that describe their object before putting these into sentences. Their text should invoke imagination and involve at least three of the four senses of sight, touch, smell and sound.

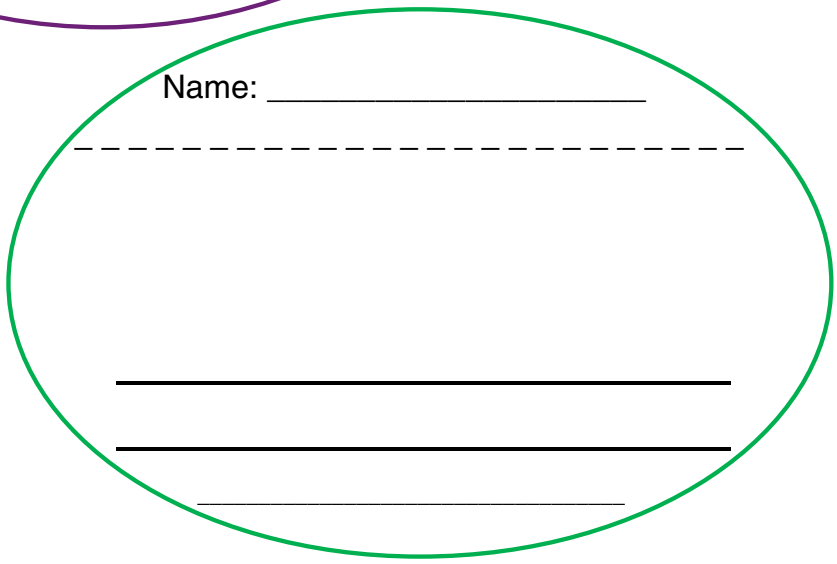
Once students have written their paragraph, they can try to draw each other's objects based only on the description.

This website has lists of many descriptive words that might help students with this activity: https://7esl.com/descriptive-adjectives/

Where do we live?

Circles: purple is the Universe, blue is the Milky Way, red is the Solar System, green is Earth. Teachers: see pages 2 and 8 in the notes for further instructions.



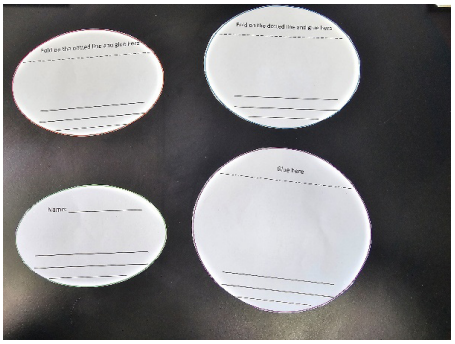


Fold on the dotted line and glue here

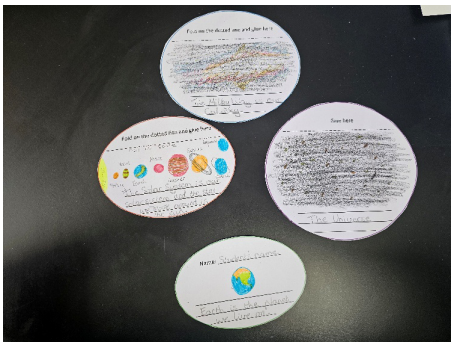
Fold on the dotted line and glue here

Instructions for making the ‘Where do we live?’ circles

1. Cut out all four circles, making sure you can still see the circle colours. **SAFETY:** Be careful when using scissors, or ask an adult for help.

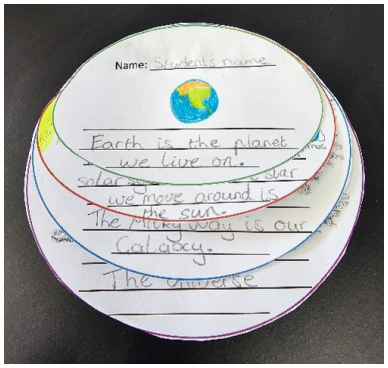


2. Draw a picture to correspond to each circle and write the phrase that matches each circle.



3. Fold along the dotted line on the green, blue and red circles. You do not need to fold the purple circle.

4. Place glue on the top of the purple, blue and red circles and then stick them together.



CSIRO PUBLISHING

Jobs in space science

Teachers: see page 5 in the notes for instructions. **Name:**_____

Job	What do they do?	Would they be at the dairy farm in the book?
Astrophysicist		
Astronomer		
Aerospace Engineer		
Engineering Technician		
PR and Communications Specialist		
Meteorologist		
Atmospheric Scientist		
Research Assistant		
Geologist		

Australian Curriculum Links (Version 9.0)

Year level	Learning area: Science	Other learning areas
Year 1	**Science Understanding: Physical sciences** • Describe pushes and pulls in terms of strength and direction and predict the effect of these forces on objects' motion and shape (AC9S1U03) **Science Inquiry: Questioning and predicting** • Pose questions to explore observed simple patterns and relationships and make predictions based on experiences (AC9S1I01)	**English: Language: Language for expressing and developing ideas** • Understand that written language uses punctuation such as full stops, question marks and exclamation marks, and uses capital letters for familiar proper nouns (AC9E1LA10) **English: Literacy: Creating texts** • Create and re-read to edit short written and/or multimodal texts to report on a topic, express an opinion or recount a real or imagined event, using grammatically correct simple sentences, some topic-specific vocabulary, sentence boundary punctuation and correct spelling of some one- and two-syllable words (AC9E1LY06)
Year 2	**Science Understanding: Earth and space sciences** • Recognise Earth is a planet in the solar system and identify patterns in the changing position of the sun, moon, planets and stars in the sky (AC9S2U01) **Science Inquiry: Questioning and predicting** • Pose questions to explore observed simple patterns and relationships and make predictions based on experiences (AC9S2I01)	**English: Literacy: Creating texts** • Create and edit short imaginative, informative and persuasive written and/or multimodal texts for familiar audiences, using text structure appropriate to purpose, simple and compound sentences, noun groups and verb groups, topic-specific vocabulary, simple punctuation and common 2-syllable words (AC9E2LY06) **HASS: Skills: Questioning and researching** • Develop questions about objects, people, places and events in the past and present (AC9HS2S01) • Collect, sort and record information and data from observations and from provided sources, including unscaled timelines and labelled maps or models (AC9HS2S02)
Year 3	**Science Understanding: Earth and space sciences** • Compare the observable properties of soils, rocks and minerals and investigate why they are important Earth resources (AC9S3U02) **Science Inquiry: Questioning and predicting** • Pose questions to explore observed patterns and relationships and make predictions based on observations (AC9S3I01)	**English: Language: Language for expressing and developing ideas** • Understand that apostrophes signal missing letters in contractions, and apostrophes are used to show singular and plural possession (AC9E3LA11) **English: Literacy: Creating texts** • Plan, create, edit and publish imaginative, informative and persuasive written and multimodal texts, using visual features, appropriate form and layout, with ideas grouped in simple paragraphs, mostly correct tense, topic-specific vocabulary and correct spelling of most high-frequency and phonetically regular words (AC9E3LY06) **HASS: Skills: Questioning and researching** • Locate, collect and record information and data from a range of sources, including annotated timelines and maps (AC9HS3S02)
Year 4	**Science Understanding: Physical sciences** • Identify how forces can be exerted by one object on another and investigate the effect of frictional, gravitational and magnetic forces on the motion of objects (AC9S4U03) **Science Inquiry: Questioning and predicting** • Pose questions to explore observed patterns and relationships and make predictions based on observations (AC9S4I01)	**English: Literacy: Creating texts** • Plan, create, edit and publish written and multimodal imaginative, informative and persuasive texts, using visual features, relevant linked ideas, complex sentences, appropriate tense, synonyms and antonyms, correct spelling of multisyllabic words and simple punctuation (AC9E4LY06) **HASS: Skills: Questioning and researching** • Locate, collect and record information and data from a range of sources, including annotated timelines and maps (AC9HS4S02)

Related books from CSIRO Publishing

For younger readers:

- *Shine, Star, Shine!* (https://www.publish.csiro.au/book/8089)
- *The Opal Dinosaur* (https://www.publish.csiro.au/book/8088)

For older readers:

- *Astronomy for Curious Kids* (https://www.publish.csiro.au/book/8163)
- *Every Rock Has a Story: An A to Z of Australian Geology* (https://www.publish.csiro.au/book/8086)
- *Rocks, Fossils and Formations: Discoveries Through Time* (https://www.publish.csiro.au/book/7864)

Other CSIRO resources

CSIRO has developed and delivered a broad range of high-quality STEM education programs and initiatives for nearly 40 years. Our programs aim to inspire the pursuit of further STEM education among students and the community, to equip the emerging workforce with tomorrow's skill sets, and to strengthen collaboration between industry and classrooms across Australia. For more information visit: https://www.csiro.au/en/Education