Lisa is

an astrophysicist

NOT GOOD AT

throwing a frisbee and doing sums in my head

LOVES

seeing galaxies whose light has taken more than a billion years to reach Earth

CAREER

Astrophysicist, astronomer, stargazer

STUDIED

Master of Physics and has a Ph.D. in Radio Astronomy

EXPERT ON

helping people connect with the universe and improving equity in STEM

WANTS TO

help people fall in love with the night sky

GOOD AT

writing books and stand-up paddleboarding

HAPPIEST WHEN

walking up mountains or cuddling dogs

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www.futureyouaustralia.com.au/pathfinders/lisa

Meet Lisa Harvey-Smith

What do you do?
I'm an astrophysicist, astronomer or stargazer if you prefer.

How did you get into that job?
When I was a kid growing up in Essex, a place in England, my mum was the head teacher at our local school. But when I was just 11, I made a big decision - I didn't want to go to regular school anymore.

Instead, I started on a journey of 'home education.' It means I learned things on my own, with my dad helping me out at home while my mum worked to support our family.

When I was 12, I went outside at night with my dad, and we looked at the planet Mars. It was amazing! I instantly fell in love with the stars. I joined a local astronomy group and read lots of books about space. I looked at the stars often and that's when I knew I wanted to be an astrophysicist – a scientist who studies things in outer space.

My dad wasn't a qualified teacher, but he has always loved reading. He taught me a lot. I didn't have to follow a strict school plan. Instead, I made my own schedule. I learned about music, poetry, stories, philosophy, history, maths, and science. Nobody made me do anything. I watched TV, the Open University and the BBC aired lots of learning programs. I would watch some of those in the morning, then read books, play my musical instruments and do other creative things like writing poems. In the evenings I'd go to local sports clubs and do judo, badminton and athletics.

I also liked watching a show called 'Home and Away' with my dad during lunchtime. That show served as an unexpected source of inspiration for my eventual journey to Australia!

When I turned 16, I went to Braintree College for my A-levels (that's like the last part of high school in the UK). I did really well there. It wasn't like a regular school – it felt more like a university, because you could come and go as you please and call the lecturers by their first names.

This unique learning style led to my exciting job. I went to the University of Newcastle-upon-Tyne and got a degree in physics with Honours in astronomy and astrophysics. Then, I studied for three years at the University of Manchester to get my Ph.D. (also known as a doctorate) in radio astronomy. After finishing school, I moved to the Netherlands, where I got to work with some of the world's most powerful telescopes. In 2007, I moved to Sydney because I wanted to explore how magnetic fields affect exploding stars. Later, I helped Australia to get the rights to co-host a giant radio telescope called the Square Kilometre Array. I've also written lots of papers and books, and I'm even the Australian Government's Women in STEM Ambassador!

I thrive in an environment where I'm trusted and allowed to do my own thing. Teaching myself at home gave me self-discipline and focus.

What do you love about your job?
I love seeing galaxies whose light has taken more than a billion years to reach Earth.

How does your job help people/the community/the world?
Astronomy helps us to understand where we came from, connect with the universe, and develop awesome inventions like medical scanners and wifi.

What are two things you're not good at?

1. Throwing a frisbee
2. Doing sums in my head

What are two things you are good at?

1. Writing books
2. Stand-up paddleboarding

What makes you happy (outside of work)?
Walking up mountains and cuddling dogs.

Where do you want your career to take you?
I want to help people fall in love with the night sky, whatever their background.

Join local amateur astronomical society

Starts being homeschooled at 11

Bachelor of Science, majoring in Physics

Summer internship with CSIRO

Masters degree in Physics

Research associate abroad for 2 years

Project scientist at CSIRO

Promoted to Research Group Leader

Publishes multiple peer-reviewed academic papers

Finishes Year 12

Bachelor of Aerospace Engineering

6-week summer internship with large tech company

Gradutes and takes entry-level role with Australian Space Agency

Promoted to Avionics Engineer - helps develop satellite technology

Develops keen interest in space science - does online astrphysics courses

Organisation covers tuition fees for Bachelor of Physics - studies part-time

Transitions into research role and studies Masters of Physics part-time

Finishes Year 10

Certificate III in Individual Support

Gets job as Aged Care Worker

Runs weekly astronomy activity for residents

Does free online courses in physics, maths and astronomy

Collaborates on citizen science projects in personal time

Wants a career change - studies Bachelor of Science part-time

Joins local astronomy club and meets astrophysicist

Applies for role as research assistant at a university

Few years later, applies for role as Research Engineer at CSIRO

Promoted to senior field technician - does Ph.D. in Astrophysics

Researcher/Scientist career pathways

Find out more at www.futureyouaustralia.com.au/resources/#other/

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The educational qualifications and levels outlined in these pathways are intended as general guidelines. To obtain accurate and up-to-date information, explore resources specific to your state or territory, available through websites like *myfuture.edu.au*, *YourCareer.gov.au* and *australianapprenticeships.gov.au*.

There is also a range of financial support available for students doing apprenticeships or going to university, visit *www.servicesaustralia.gov.au/education* to see what's available.

- Bachelor of Science: https://www.courseseeker.edu.au/
- Summer internship: https://womeninstem-careershub.prosple.com/
- Masters of Physics: https://www.courseseeker.edu.au/
- Study abroad: https://www.unsw.edu.au/study/international-students/study-abroad

- Bachelor of Aerospace Engineering: https://www.courseseeker.edu.au/
- Summer internship: https://womeninstem-careershub.prosple.com/
- Bachelor of Physics, Masters of Physics: https://www.courseseeker.edu.au/

- Certificate III in Individual Support: https://training.gov.au/Training/Details/CHC33021
- Online maths and science courses: https://www.open.edu/openlearn/science-maths-technology/free-courses
- Bachelor of Science: https://www.courseseeker.edu.au/

Remember, there are countless pathways to the same career. Each child's unique skills, interests, and strengths will guide them on their personal journey to success.

Comprehension Questions

Australian Curriculum V9.0 links for Years 3 to 7

English
- Literacy

General Capabilities:
- Literacy

Learning outcomes:

All students will be able to:
- Identify that all people have strengths and weaknesses
- Actively think about what is happening in various texts as they read them
- Apply comprehension strategies to different media formats

In addition, some students will be able to:
- Identify different reasons for doing different jobs

Instructions:

- Format/print the students' question sheets (or load them onto school LMS) and direct students to a copy.
- Read the questions as a class to start, discussing any meanings
- Discuss with the class strategies for being able to answer the questions as they read about Lisa
- Read about Lisa as a class, encouraging students to answer questions as you go

Adaptation note: Questions can be modified on the PDF to meet students' needs or learning focus areas in your classroom

Comprehension questions

1. What three job titles does Lisa give herself?
2. What does Lisa love about her job?
3. What inventions are astronomy responsible for?
4. What does Lisa want to do?
5. What two things is Lisa not good at?
6. What two things Lisa is good at?
7. What does astronomy help us to understand?
8. What big decision did Lisa make when she was 11?

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Answers:
1. She's an astrophysicist, astronomer or stargazer
2. She loves seeing galaxies whose light has taken more than a billion years to reach Earth.
3. Medical scanners and wifi
4. Help people fall in love with the night sky, no matter their background
5. Throwing a frisbee and doing sums in her head
6. Writing books and stand-up paddleboarding
7. Where we came from
8. She didn't want to go to regular school anymore.

Lisa

Student name:

Comprehension Questions

What three job titles does Lisa give herself?

1.

2.

3.

What two things is Lisa not good at?

1.

2.

Name two things Lisa is good at.

1.

2.

What does Lisa love about her job?

What does astronomy help us to understand?

What inventions are astronomy responsible for?

1.

2.

What big decision did Lisa make when she was 11?

What does Lisa want to do?

Capability Convos

Australian Curriculum V9.0 links for Years 3 to 7

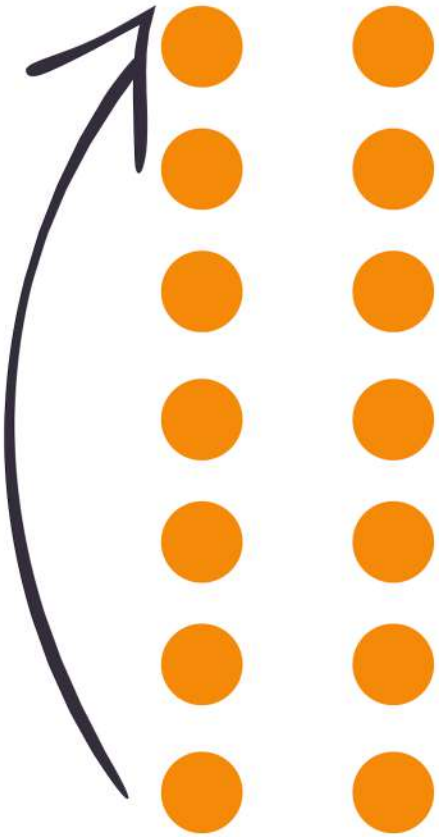
English
- Language
- Literacy

General Capabilities:
- Critical and Creative Thinking
- Personal and Social Capability
- Ethical Understanding
- Literacy

Learning outcomes:

All students will be able to:
- identify some likes, dislikes, strengths, abilities and/or interests when showing a personal preference
- acknowledge that people have different needs, emotions and abilities

In addition, some students will be able to:
- describe the ways they are connected and can contribute to their community groups



Format
- Interactive game with 10 questions
- Easy to play
- Read Meet Lisa to learn more about Lisa's job and journey with the class
- Print the questions
- Play the game
- Modify or include new questions based on students' needs

Scan this QR code to find out more about me.

SCAN ME

Instructions for students

Line the class up in two lines facing each other to form pairs. Ask the first question. Once each pair has discussed it, get one line to move one person to their right. The person at the end runs around to the other end of the line. Then you ask the next question and repeat the process until all the questions have been asked.

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www.futureyouaustralia.com.au/pathfinders/lisa

Lisa
Astrophysicist

Question 1
What do you think is interesting about Lisa's career?

Question 2
What skills does Lisa have that you also have, and does she have any skills you don't have that you would like to have?

Question 3
Why do you think it's important to find a career that suits your skills and personality?

Question 4
How are your interests and hobbies similar or different to Lisa's career?

Question 5
How do you think Lisa's career contributes to society?

Question 6
What sort of benefits do you think Lisa might have doing this job in a rural or remote location?

Question 7
How important are mathematics and engineering in Lisa's job? Can you think of some examples?

Question 8
What tools or technology do you think Lisa needs to do her job?

Question 9
How do you think AI might change Lisa's job in the future? Can you think of some examples?

Question 10
What do you think would be the biggest challenge in pursuing a career as an astrophysicist?

Astrophysicist

Lisa is an astrophysicist who loves seeing galaxies whose light has taken more than a billion years to reach Earth. Lisa was homeschooled from the age of 11 and has worked on exciting projects like the Australian Square Kilometre Array Pathfinder telescope at CSIRO. Find out more:

futureyouaustralia.com.au/pathfinders/lisa

"Astronomy helps us to understand where we came from, connect with the universe, and develop awesome inventions like medical scanners and wifi."

STEM Meter

How much Science, Technology, Engineering and Mathematics (STEM) does this job use?

Source: jobsandskills.gov.au

5 reasons why you should do this job

1. You get to explore the universe
2. Solve cosmic puzzles
3. Be part of groundbreaking discoveries
4. Be a role model for future generations
5. Endless opportunities to learn

3 STEM skills required for this job	Subjects to develop these skills
Reading comprehension	English
Critical thinking	Science, Mathematics, Digital Technology
Complex problem solving	Design and Technologies, Digital Technology

A example of a day in the life of an astrophysicist

6.00am I'm up before dawn because I love staring each day with some cosmic perspective. I enjoy some overnight oats and watch as the night sky gives way to the day.

7.00am Time to get dressed. Today I choose a comfortable blend of casual and intellectual with a cosmic-themed shirt and some tailored trousers.

8.00am I head out the door and to the bus stop because today I've got telescope time scheduled. Normally I work from home, but today I'm going to the office. I take the bus because it gives me time to mentally prepare for the celestial discoveries that await. Of course, I listen to some space-themed music on my way. It gets me excited for the day.

9.00am I convene with my team for a morning strategy session. We discuss research goals, ongoing projects, and collaborative opportunities. It's important to keep the conversation dynamic, focusing on the astronomical wonders we collectively aim to explore.

10.00am I sit down at my desk in front of my computer and prepare to immerse myself in the sea of astronomical data. I analyse star patterns, study celestial phenomena, and contribute to the scientific tapestry of the cosmos. I put my analytical skills to good use and attempt to decode the language of the universe in concise, active sentences.

1.00pm Time to pause for lunch. I meet my colleagues in the breakroom and we discuss some of the latest discoveries of the universe. There's never a dull moment at lunch and there's always something exciting to talk about.

2.00pm I have a virtual meeting with some fellow astrophysicists. We share hypotheses, exchange insights, and debate the mysteries of the cosmos. This is a great opportunity for us to really delve deeply into some of the questions that I have following my morning of universal language decoding.

3.00pm It's the most exciting part of my day! I head to the observatory for a session with the telescope. This is my chance to witness the cosmic ballet firsthand, capturing images and data to unravel the secrets of distant galaxies. I capture my observations into precise and impactful descriptions using my phone.

4.30pm I get back to my desk and input my observations into the immense data collection I have been compiling for years. This work is vital to helping us better understand the universe and where we come from. I spend the last few hours of my day making sure the data I input is clean and all the correct detail is there. Once I've finished this, I shut down my computer, say goodbye to my colleagues, and head out the door.

6.00pm Tonight I am participating in a public lecture as part of an educational outreach program I'm a mentor for. I love these sessions. I get to communicate complex astrophysical concepts in a clear and accessible manner, ensuring everyone can grasp the wonders of the cosmos. I love watching people's reactions to learning more about the universe.

8.00pm I wrap up my day by heading home and reheating some leftovers from dinner last night. Today was a big day, but very rewarding.

9.30pm To help me wind down I head outside to stargaze from the comfort of my backyard. As an astrophysicist, I find immense joy in taking a moment each evening to stare up at the night sky and wonder what I'll discover tomorrow.

10.30pm Time for bed. I crawl under the covers and hope that I'll dream about galaxies billions of light years away.

Astrophysicist

STEM Meter

How much Science, Technology, Engineering and Mathematics (STEM) does this job use?

Source: jobsandskills.gov.au

Lisa is an astrophysicist who loves seeing galaxies whose light has taken more than a billion years to reach Earth. Lisa was homeschooled from the age of 11 and has worked on exciting projects like the Australian Square Kilometre Array Pathfinder telescope at CSIRO. Find out more:

futureyouaustralia.com.au/pathfinders/lisa

"Astronomy helps us to understand where we came from, connect with the universe, and develop awesome inventions like medical scanners and wifi."

Job stats and facts

Future job growth: Over the next five years jobs in this field are expected to grow moderately.

Location: Astrophysicists can work from anywhere.

Employment pathways: A bachelor degree in a related field is required.

3 STEM skills required for this job	Subjects to develop these skills	3 other jobs that value this skill
Reading comprehension	English	Data Scientist, Lawyer, Radiologist
Critical thinking	Science, Mathematics, Digital Technology	Human Resources Manager, Software Engineer, Veterinarian
Complex problem solving	Design and Technologies, Digital Technology	Video Game Developer, Air Traffic Controller, Social Worker

An Australian Government Initiative | Women in STEM Ambassador

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Other careers related to this line of work

Economy

Human Resources Specialist
Social Worker
Psychologist
Market Researcher
Criminal Investigator

Education

Physics Teacher
Planetarium Educator
Science Communicator
STEM Outreach Coordinator
Curriculum Developer

Leadership

Project Administrator
Research Director
Chief Science Officer
Space Program Manager
Chief Technology Officer

People

Science Journalist
Science Policy Analyst
Science Museums Director
Astronomy Outreach Coordinator
Science Librarian

Environment

Environmental Scientist
Atmospheric Scientist
Geophysicist
Space Weather Forecaster
Astrobiologist

The world is changing rapidly, and this means the career possibilities available to our kids are wide-ranging and exciting (and probably, don't exist yet!).

From traditional vocations to emerging fields, there are countless pathways to be explored.

Parents and teachers can create environments that encourage kids to discover and investigate possible careers that match their skills and interests.

We've included some links to other valuable resources that can help guide career conversations and explorations. Find out more at:

www.futureyouaustralia.com.au/resources/other

Pathfinder Workwords

Astrophysicist

R W B Q E X G G Z J I Z S C N D E O U T S T R
Q T F L F N R A A Z O G T Y S R C X N N N S E
S O V Z A H W T L X G A E S I I C U I C O O V
T E L E S C O P E A Y B M T S O Q P V G I W P
N F L Y B V K Q E T X G O A Y Y U C E U T L P
C R L A G I D F I K H I C R L H J D R B A N P
A K X A N N H V P C M J E S A M N M S N V H F
H T K G R K A Q R H B C K S N R X H E K R O Z
A H A C R R W A Y L H B H D A C C T U T E L N
S L H D G M E D A S T R O P H Y S I C S S E U
C R A L O S I E R E M O N O R T S A E R B Y M
S I M Q E N O I T A I D A R W O G Q U U O L S
E P M R S P E C T R O S C O P Y F X L S A M R
V X A S H E X O P L A N E T S P V A H N L J S
P D E C O S K U F N X U D M Y R E K X L D F Y
N F G J E C H O D N Q O T I H W E Y H K T G U

Find 20 words Lisa needs to do her job.

1. TELESCOPE
2. GALAXIES
3. STARS
4. PLANETS
5. ASTRONOMER
6. COSMIC
7. OBSERVATIONS
8. GRAVITY
9. EXOPLANETS
10. BLACK HOLE
11. NEBULAE
12. SOLAR SYSTEM
13. COMETS
14. RESEARCH
15. ASTROPHYSICS
16. SPACE
17. UNIVERSE
18. RADIATION
19. DATA ANALYSIS
20. SPECTROSCOPY

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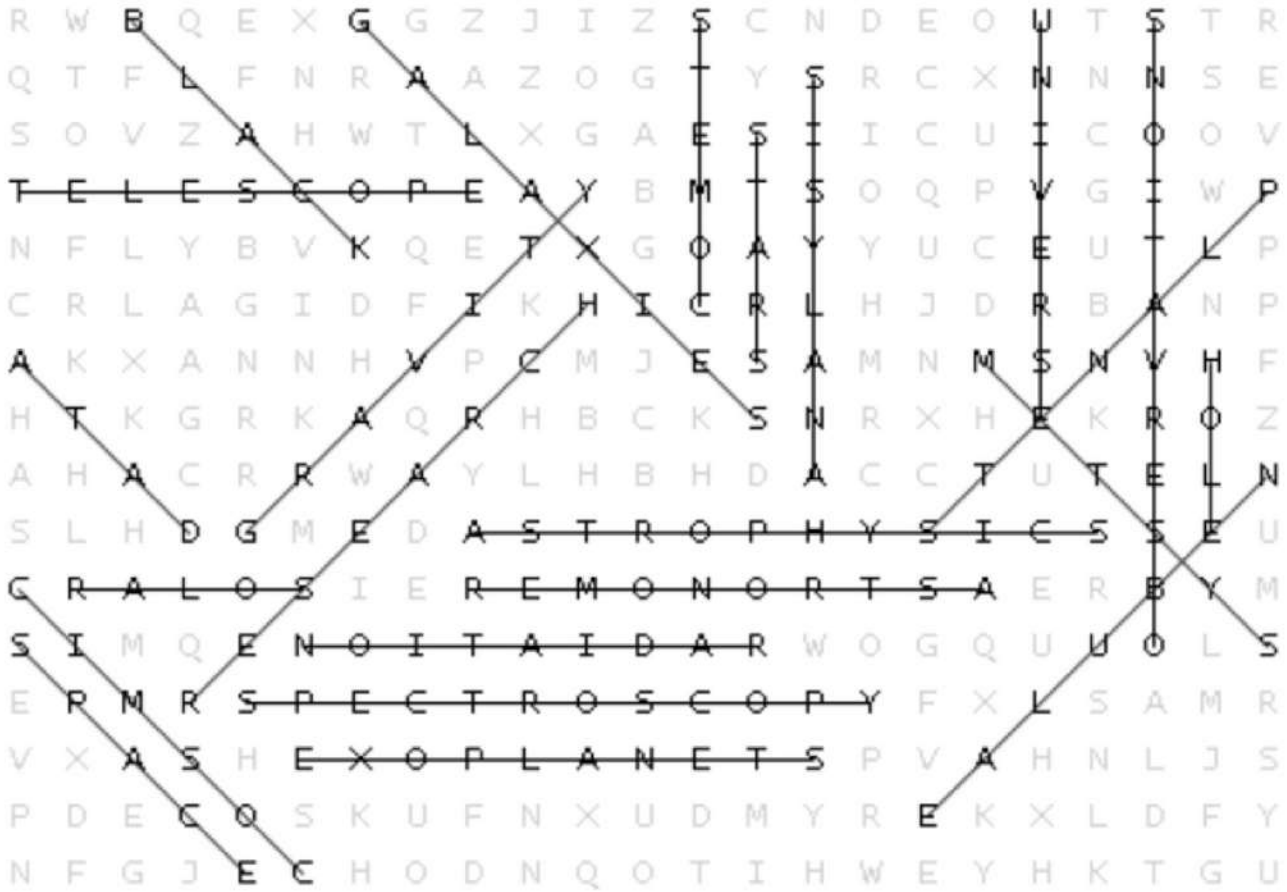
Pathfinder Workwords

Answers



Let's reflect

Were any of these words new to you? Look them up and find out what they mean.

Which of these skills do you think you are best at, or would like to get better at?

1._____

2._____

3._____

Can you think of anything else Lisa might need to do her job?

_____

Meet Lisa. She's an astrophysicist who loves seeing galaxies whose light has taken more than a billion years to reach Earth. Fill in the bubbles with 5 STEM (Science, Technology, Engineering and Mathematics) skills she uses in her job. Which of these skills do you think is most important? Which do you think would be the hardest to develop? When you've thought of the skills, colour in the rest of the image.