

Meet a STEM Professional - Active reading and listening tasks





SARAH CROWTHER

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KEYWORD

cosmochemistry

ABOUT THE TASK

This is an active listening and reading task, that uses the SEEC model to develop understanding of key words. It is designed to inspire pupils to develop questions to ask Sarah about her career journey to becoming a STEM professional.

ENGAGE



Ask the pupils to watch the video in full.

Then watch again, stopping at 2 mins 56 seconds

Use the SEEC model to develop understanding of key words, and to encourage the pupils to develop questions to ask Sarah about her career journey to becoming a STEM professional.

SEEC = select, explain, explore, consolidate



<https://youtu.be/tOnpamdsFUI>

ABOUT SARAH - SUMMARY

- Sarah's job involved looking closely at pieces of extra terrestrial materials such as samples of meteorites and the moon to help understand the evolution of our solar system.
- Through analysis of the materials Sarah looks at how the material started and evolved to the planets we see today.
- Sarah always wanted to be an astronaut when she was younger (she still does!) When she was at school, Sarah didn't know how she could pursue a career in space.
- Sarah was always interested in science subjects at school and did A-level Chemistry, Physics and Maths and went to university to study Chemistry.
- She completed her PhD in Physical Chemistry and now works at the University of Manchester.
- Sarah would like to get involved with a sample return mission from Mars to change and influence our current understanding of Mars.

MANCHESTER
1824
The University of Manchester

ABOUT SARAH
HER JOURNEY INTO STEM
Sarah's always had an interest in space and still wants to be an astronaut when she grows up! When she was at school she didn't really know how to pursue that interest or work in a job that's related to space but her job now lets get as close to being an astronaut as she can, because she gets to study space and at the same time use experimental techniques.

In school, Sarah was always interested in science subjects, Chemistry, Physics and Maths in particular. She then went to university to study Chemistry. After her degree, Sarah completed a PhD in Chemistry and Physical Chemistry before becoming a Research Fellow at the University of Manchester.

HER JOB
In Sarah's job she looks at the evolution of the Solar System. She analyses samples of extra-terrestrial materials things like pieces of meteorite, or samples from the moon that the Apollo astronauts brought back. She looks at their chemical composition and sees what that tells us about what was the starting material that the solar systems formed from and how that starting material has changed to become the planets and other bodies in the Solar System that we see today.

HER HOBBIES
Sarah enjoys solving difficult Sudoku puzzles or reading a good book. She also likes making her own ice cream! She enjoys watching football (mostly on TV), and supports Manchester United.

THE QUESTION SARAH WANTS TO ANSWER IS...
She'd love to have samples of material from Mars and find out more about the planet closest to Earth! This would help us to find out more about the history of Mars and improve our understanding of the evolution of planets in the Solar System.

SARAH'S QUESTION FOR YOU...
How long would it take to travel to the other planets?

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WATCH
<https://youtu.be/tOnpamdsFUI>

KEYWORD

cosmochemistry

ACTIVE LISTENING

Access the Collins CoBuild dictionary to help with pronunciation, definitions and synonyms. Visit www.collinsdictionary.com/

1. SELECT

Sarah describes her job as a research fellow in Isotope Geochemistry and **Cosmochemistry**

The keywords words are likely to affect the pupil's understanding and engagement with Sarah's profile. The terms may not be part of the prior knowledge.

Focus on unpicking these words carefully.

Pupils may also be interested to know that **Geochemistry** uses the principles of chemistry to explain the mechanisms behind major geological systems such as oceans and the Earth's crust. Sarah works more in the field of Cosmochemistry

Also, **Isotope** means atoms that have the same number of protons and electrons but different numbers of electrons therefore different physical properties

2. EXPLAIN

- **Say** – Tell the pupils to repeat the words carefully pronouncing all the syllables
- **Write** - Ask the pupils to write the words checking their spelling is correct
- **Definition** – Explain that Cosmochemistry is the study of the chemical make up of meteorites and other physical samples. Cosmochemists usually work with objects from within the solar system
- **Ask** – Invite the pupils to give examples of using these words which will support them to clarify meanings and allow you to identify any misconceptions or misunderstandings

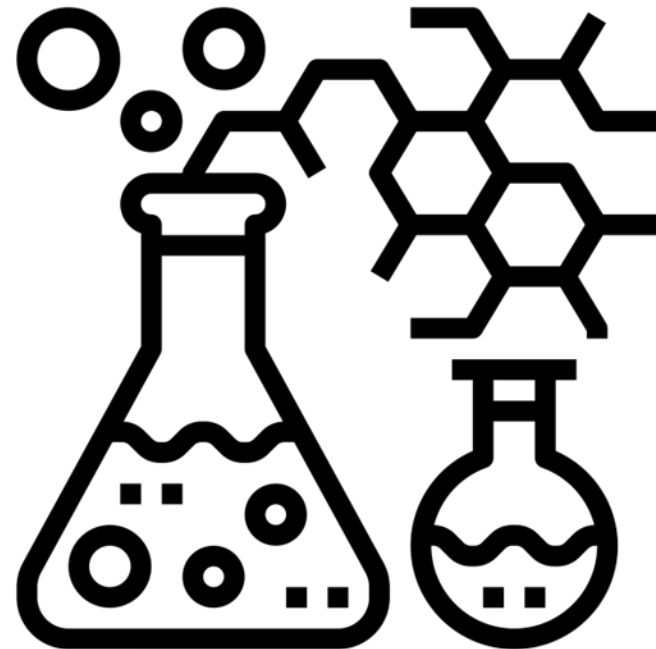
Cosmochemistry

Cosmo



Created by scribble.glyph
from Noun Project

Chemistry



Created by Template
from Noun Project

3. EXPLORE

Etymology is finding out about where the word comes from. In this part of the task, pupils explore the etymology of the keywords.

Cosmochemistry (*noun*) meaning the study of the chemical composition (what they are made of) of the celestial bodies (eg planets, meteorites)

Cosmo (*comes before a noun*) indicates the world or universe from the Greek - cosmos. Examples of the combined form include cosmology, cosmonaut, cosmography

Chemistry originates from around 17th Century and comes from chimist meaning chemist and has 3 meanings (*all unaccountable nouns*)

1. a scientific study of the structure of substances and the way they react with other substances.
2. the chemistry of an organism or material is the chemical substances that make it up and the chemical reactions that go on inside it.
3. Where there is chemistry between two people, you mean they are attracted to each other or like each other very much

Explore further examples and questions from the pupils relating to the keywords.

Images could be shown or drawn that link with the word.



4. CONSOLIDATE

- **Test and learn** – revisit the keywords at regular intervals until you are sure there is a depth of understanding. Use some of the ideas already tried in other sections of the SEEC model as a quick quiz or reminder.
- **Research and record** – find out more about these words – what else can you find out about or is connected to the word cosmochemistry



<https://youtu.be/tOnpamdsFUI>

- Ask the pupils to explain in their own words what Sarah does. Ask them to explain what they understand about by the meaning of the keyword – **Cosmochemistry**?
- **Using the keyword in the world** – ask the pupils to use the words **Cosmochemistry** to produce questions for Sarah.

Use the [Question Maker](#) to support this task.

Question Frame

What you need?

A pair of scissors, a pencil, an object that you're curious about, sticky labels (optional).

How does it work?

- 1 Make a frame out of an old cardboard box or use the printable. Be careful when cutting out the window in the centre.
- 2 Place the frame over an object or image, so that it appears in the window.
- 3 Observe what it looks like and describe what you can see.
- 4 Now, think about questions you have and jot them on a sticky note around the side of the frames.
- 5 Select the question(s) you wish to share.



5. COLLATE Questions for Sarah

First name	Gender	Age	Question

Email at least 10 questions **together with** up to 10 photos of the pupil's work using the Question Maker to fascinate@manchester.ac.uk.

We will aim to get answers to as many as possible using a pre-recorded film with Sarah or as a live Question & Answer session. You can also tweet James using @SarahACrowther