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Unlocking the Stars: Astronomy Education in the UK

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Prof Kevin Walsh – Westminster School
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Why Astronomy? Why Now?

- Astronomy and space science inspires curiosity and is a gateway to science
- RAS mission: advocate for astronomy, geophysics, and space science
- Strategic focus on reaching low socio-economic groups
- Offer new and accessible STEM pathways



GCSE Astronomy: Traditional but Challenging



- Pearson Edexcel, exam-based qualification
- Outdated textbook (First published in 2001 - 2017), no official Pearson version
- Two-year course starting with Y9
- Dropout rate: ~85% in some cohorts
- Assessment: a two-part final exam and observational tasks
- Schools are hesitant to participate, fearing it could impact their performance metrics



HPQ Astronomy: A New Research-Based Pathway



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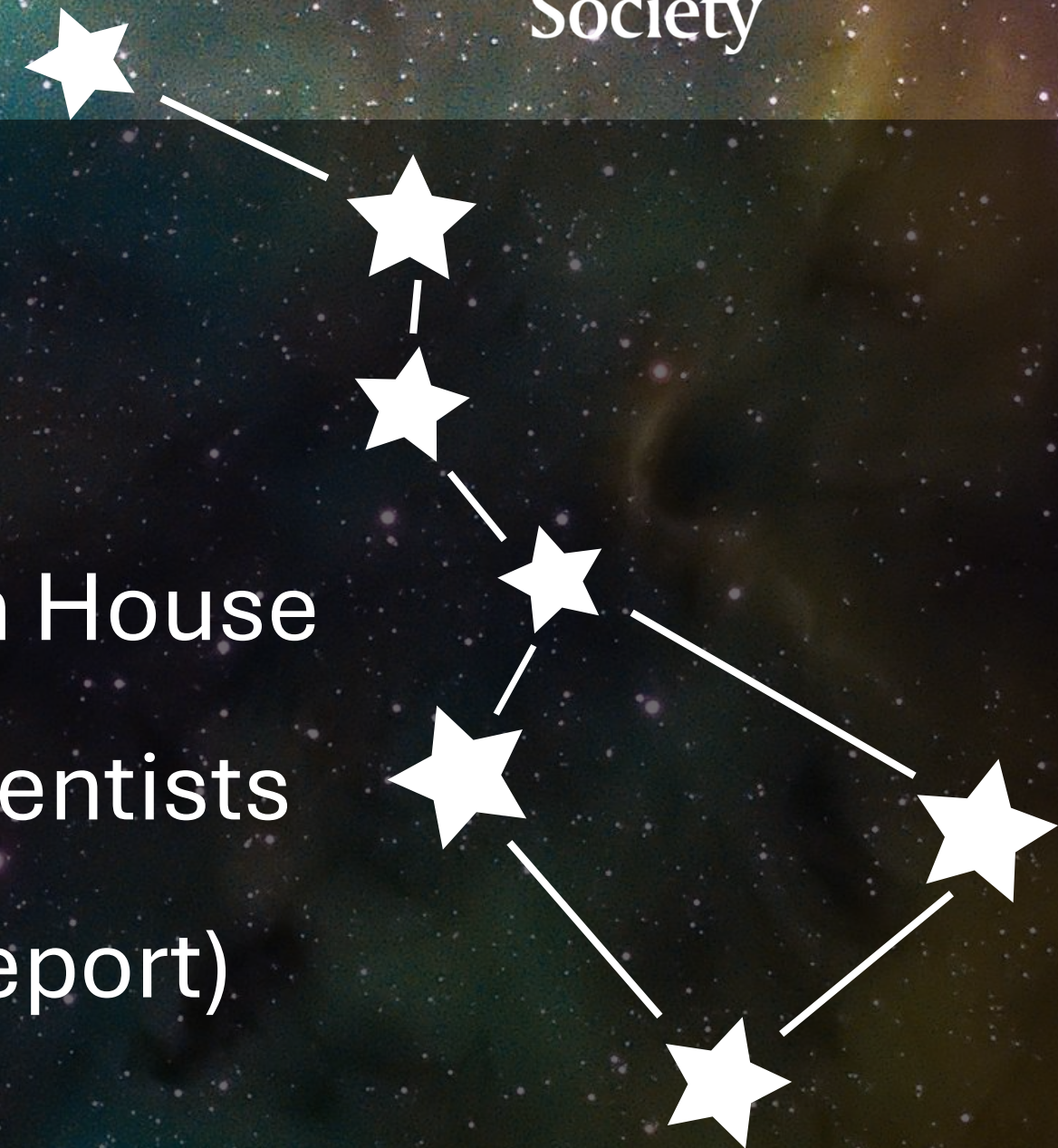
- First piloted by RAS (Sept 2024 – May 2025)
- Two-year course equivalent to 1 GCSE, begin in Y9
- 60 GLH: 20 teacher-guided + 40 independent
- Students choose topic, complete research paper + artefact
- HPQ outcomes are not factored into schools' average academic results



Building Academic & Scientific Thinking



- Literature review, research logbook, and peer presentation
- Students present to RAS Fellows at Burlington House
- Aligns with RAS mission to cultivate future scientists
- Similar to UCL's ORBYTS model (see impact report)



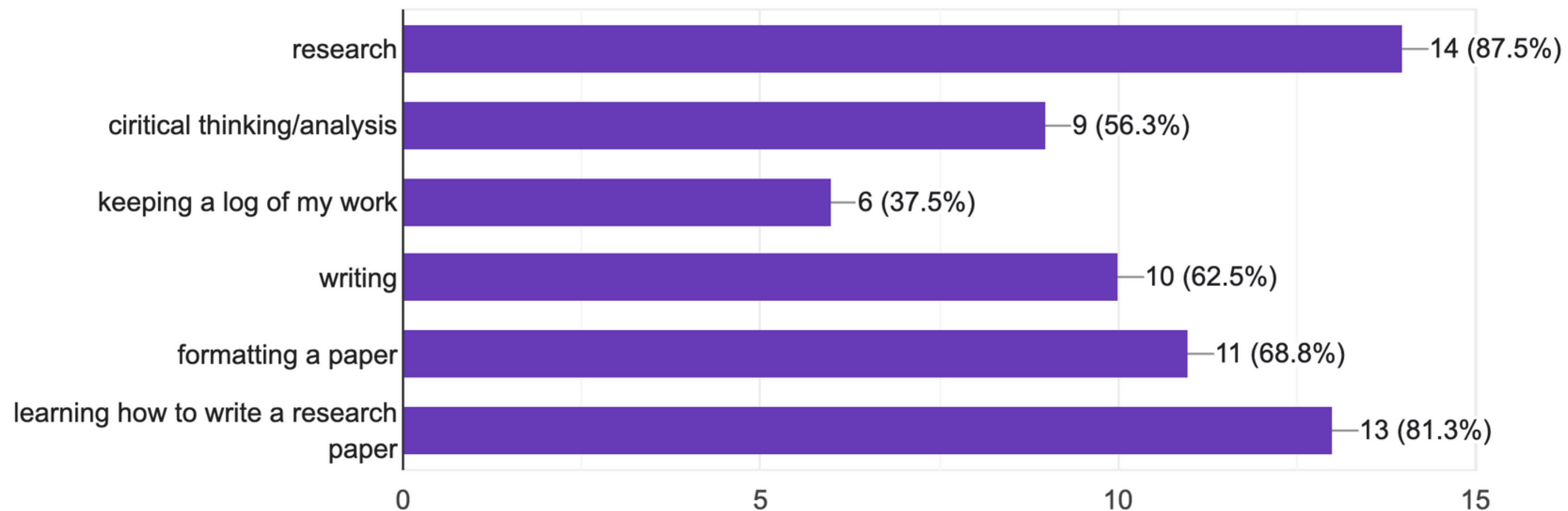
Building Academic & Scientific Thinking



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6. What new skills do you feel you gained from this course (e.g., research, critical thinking, using telescopes, writing)?

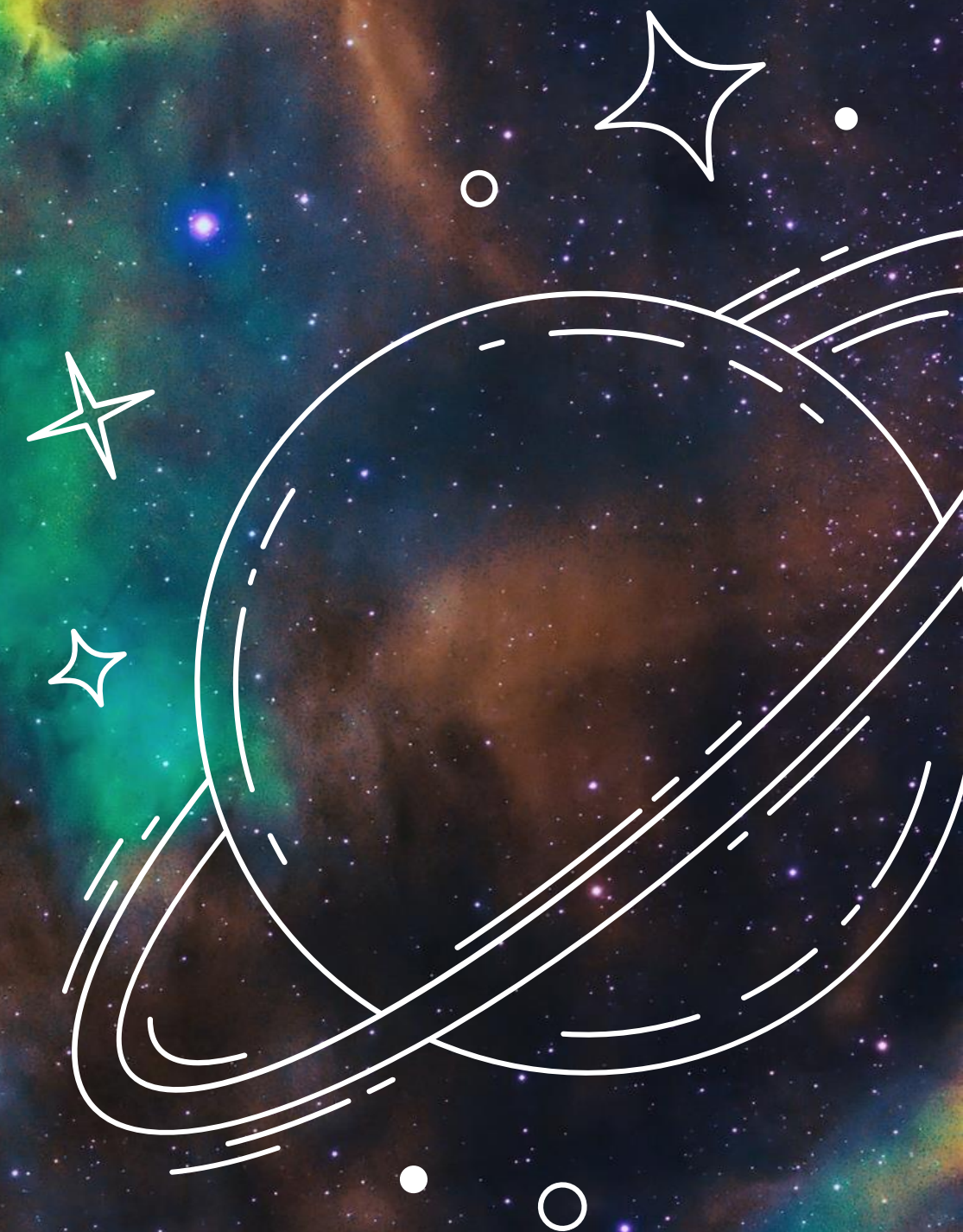
16 responses



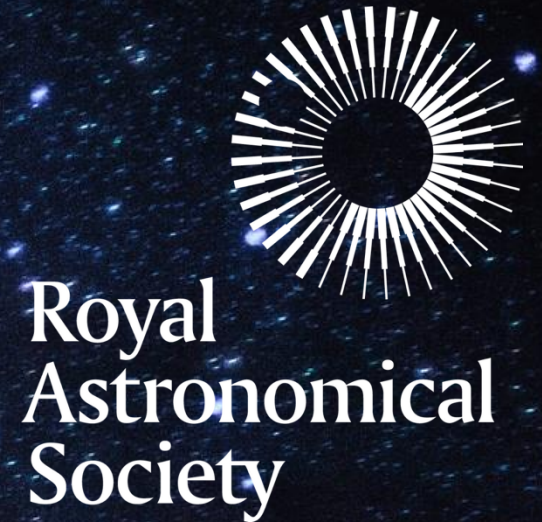
RAS HPQ Student Survey, 2025

GCSE vs HPQ: Key Comparisons

Category	GCSE	HPQ Astronomy
Format	Exam-based	Project-based
Assessment	Two-part Final exam	Research paper + artefact
Retention	~15%	~54%
Student Agency	Limited	High (topic choice + pacing)
Resource Gaps	Outdated textbook	Based on Pearson spec



Student Voices & Results



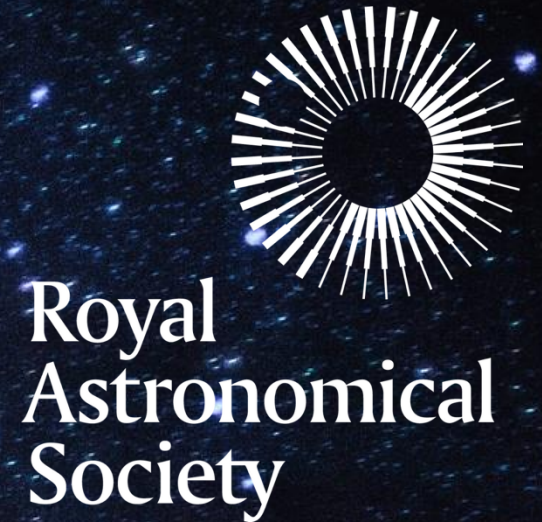
What was your favourite topic or activity in this course, and why?

- “I liked writing the dissertation because it helped me gain lots of knowledge that I would have not been exposed to otherwise”
- “I really enjoyed the earlier HPQ sessions when we learnt about stars. However, my favourite part of my independent research was reading different articles with so many different perspective[s].”
- “Researching about the HPQ Question, because it gave me and other students a choice on what they can learn for the body of the HPQ.”

Did you feel supported in your learning throughout the course?

- “I felt supported in my learning throughout the course because I had a lot of teachers who helped me alongside the course, and they provided information to me that helped me significantly in my research paper.”
- “I feel as though we were given the right balance of independence and support. We were told how to achieve everything we needed to throughout the HPQ.”
- “I felt like I have received a lot of support from my school teachers and Google classroom information.”

Student Voices & Results



Did this course change how you think about science or space?

- “I have developed a true interest in astronomy, I have read books, watched series, and done research outside of this HPQ”
- “It made me realise just how much I love astronomy as a subject but I don't think it really changed my perception of science as a whole.”
- “I now have a much wider understanding of space, and I am now a lot more interested in science.”
- “It broadened my horizon on what was more there was to explore.”

Would you recommend this course to another student? 75% said yes.

- “I would recommend it to others because it can be useful to them if they want to do anything research or science-related, and they are interested in science.”
- “I would recommend this course to those who want to learn more and are willing to work hard. If you aren't willing to work hard then this course isn't for you, in my opinion at least.”
- “i think that astronomy is a very interesting subject that everyone should have the chance to study, and the course is very detailed. there are many things you will learn here that you would not learn in school.”

Student Voices & Results



Constructive feedback:

- “Remind us to do our activity log weekly. Otherwise, it was perfect. Quite a bit of work but not an overwhelming amount.”
- “Explaining and showing the slides slower and giving people time to write or draw diagrams”
- “More access to help and knowing when assignments are due”
- “More communication, more support”
- “I think that we got some great advice but timelines were often unclear and it was sometimes difficult to get in touch.”
- “The activity log [was least favourite]. I really struggled keep track of what I did or did not do every single week.”
- “[Least favourite subject]: The sun, i have never really been interested in it.”

“I really enjoyed it and I wish I could do something like this again.”



COULD THE STUDY OF THE MOON'S INFLUENCE ON EARTH'S TIDES AND ECOSYSTEMS PROVIDE INSIGHT TO THE EFFECTS BLACK HOLES HAVE ON SURROUNDING SPACE ENVIRONMENTS?

What's behind the mystery of Tabby's Star?

'What arguments and evidence are there for and against life on Mars?'

By Elza Raghuvanshi

What potential applications of MOXIE's technology could enhance public health through air quality monitoring?

Why are supernovae so bright?



SN2016aps (supernova)

Dahlia Abi-Mershed
What Can Occur When an Object Crosses the Event Horizon of a Black Hole?

Astronomy Research Paper

End date: Wednesday 19th March 2025

Why are meteors and meteorites so rare and so highly valued?

Which has had a greater influence on the field of space discovery and our understanding of the universe: JWST or Hubble?

How did Cecilia-Payne Gaposchkin discover that Hydrogen and Helium are the most abundant elements in stars?

Imogen Capitano-Hardy HPQ



How Might Hawking Radiation Exist?



WHAT HAPPENS DURING A SUPERNOVA EXPLOSION?

BY: Kayla Gjura



Can we thrive on the Moon? a comparison of human habitation on the Moon, Mars, and Europa

Julia Galutowska



Why is the night sky dark?

A summary by Carmen



How do the factors of the Drake equation show the likelihood of there being other life?

By Asha Bose, St Marylebone

8/22/25



HOW TO DIFFERENTIATE A DWARF PLANET TO A PLANET?

By Mwewa Chomba

Solar System



Can We Thrive on the Moon?

A Comparison of Human Habitation on the Moon, Mars, and Europa

Julia Galutowska, RAS HPQ 1



Why are meteors and meteorites so rare and so highly valued?

By Raina Dunbar

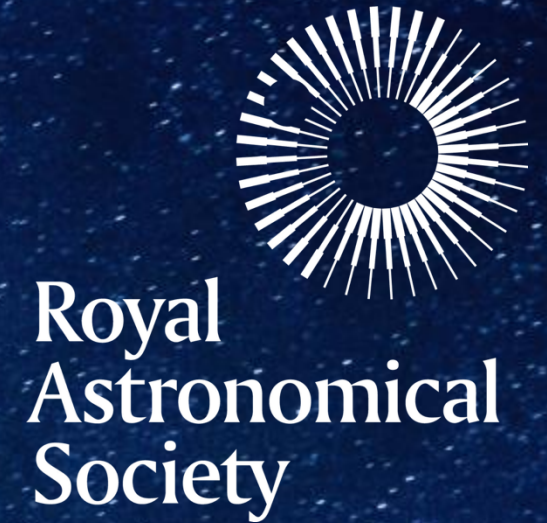


What happens to the matter around the star during a supernova explosion?

By :Kayla Gjura

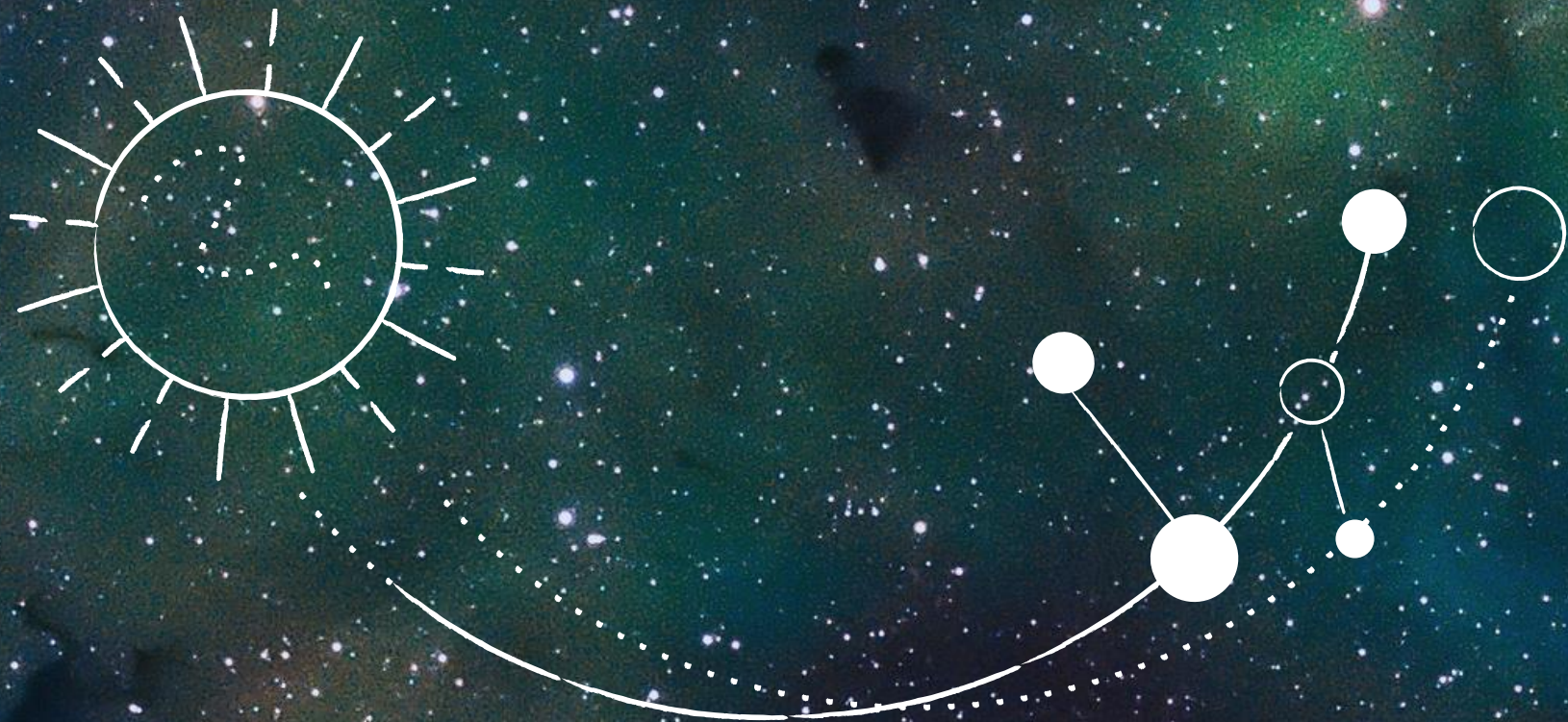


Reflections & Next Steps



- HPQ supports flexible, inclusive science learning
- Builds long-term academic and research skills
- Next time we will tighten up the schedule to finish before Easter
- Involve teachers on the Google Classroom for access to information
- Better explain the evidence required and the cost to schools
- Post schedule online for student access with reminders
- Offer teacher CPD via AEON to collaborate with RAS
- References:
 - ORBYTS Impact Report: orbyts.org/impact
 - Pearson HPQ Spec: qualifications.pearson.com

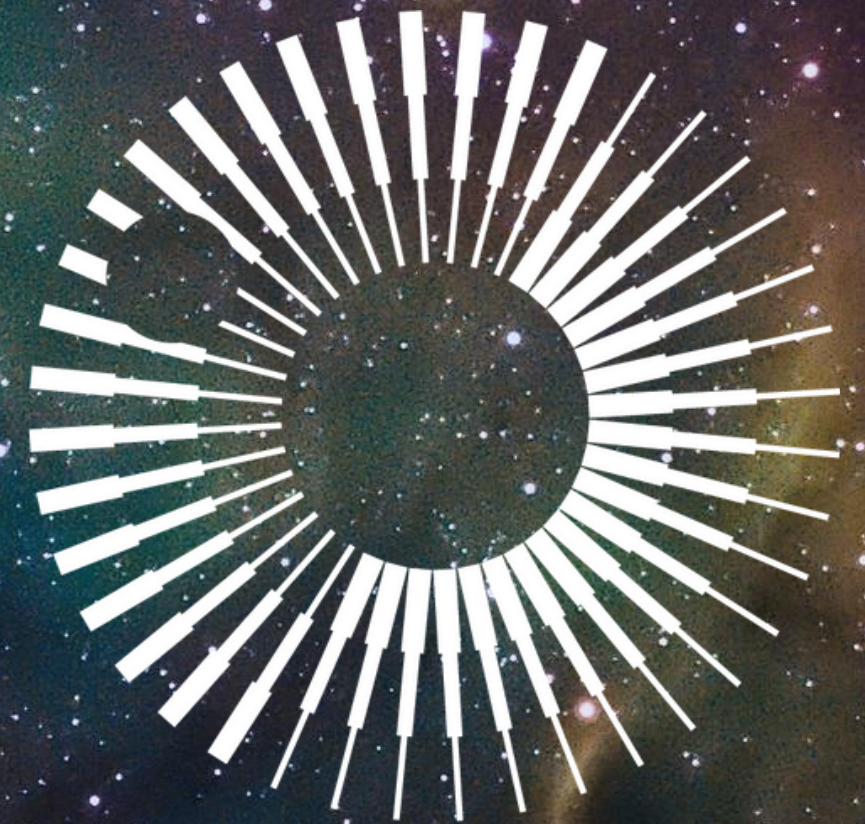




Thank you, EAS



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