

**Research Space**  
Conference paper

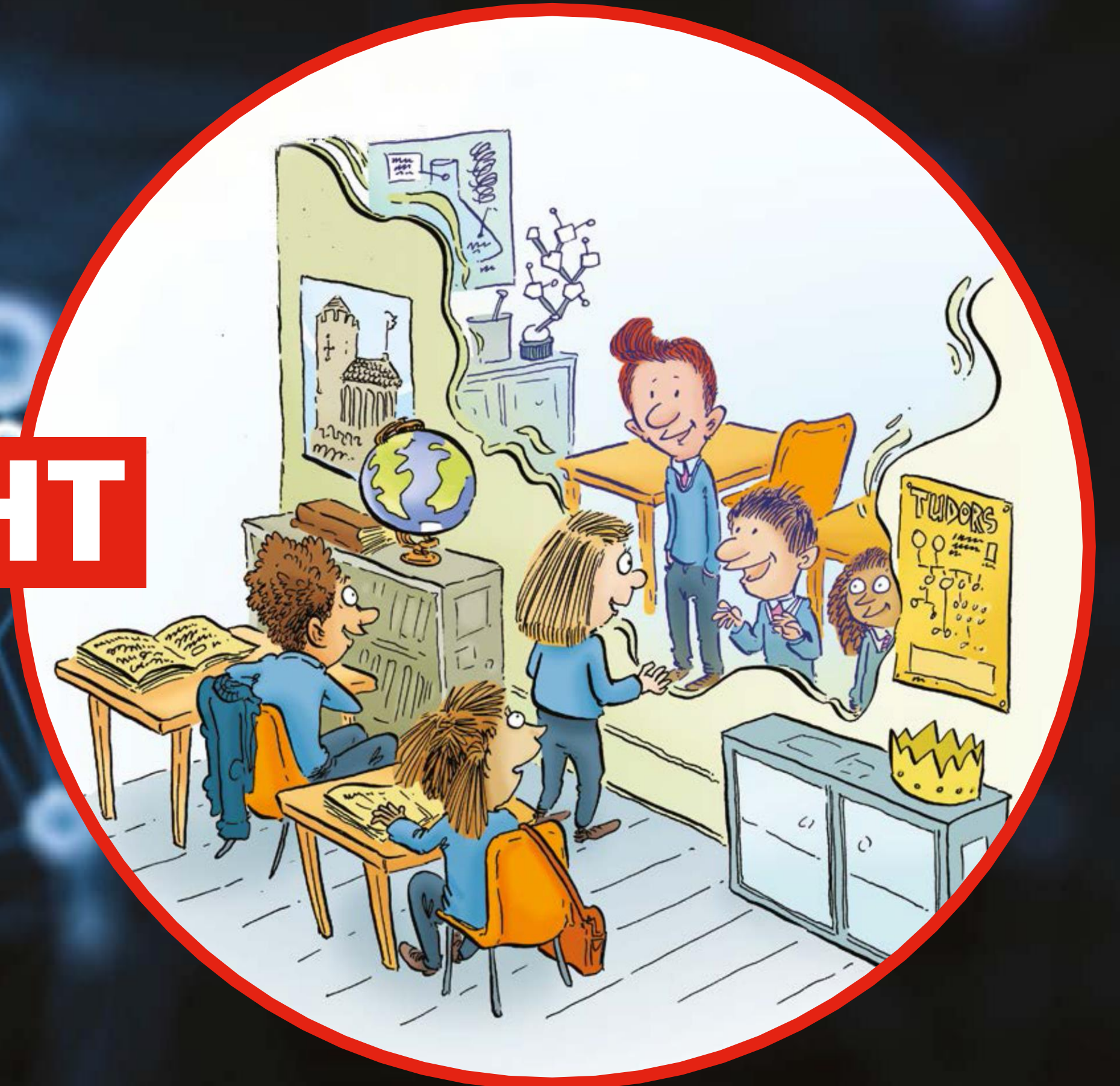
**Epistemic insight: a systematic problem and an ecosystemic solution.**

**Nassaji, M. and Gordon, A.J.**

Epistemic Insight

# THE EPISTEMIC INSIGHT INITIATIVE

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# The Epistemic insight Initiative: Identifying a systematic problem and proposing and testing an Ecosystemic solution

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University



Students' insight into the working of their own education in relation to its impacts on their thinking about the nature of knowledge

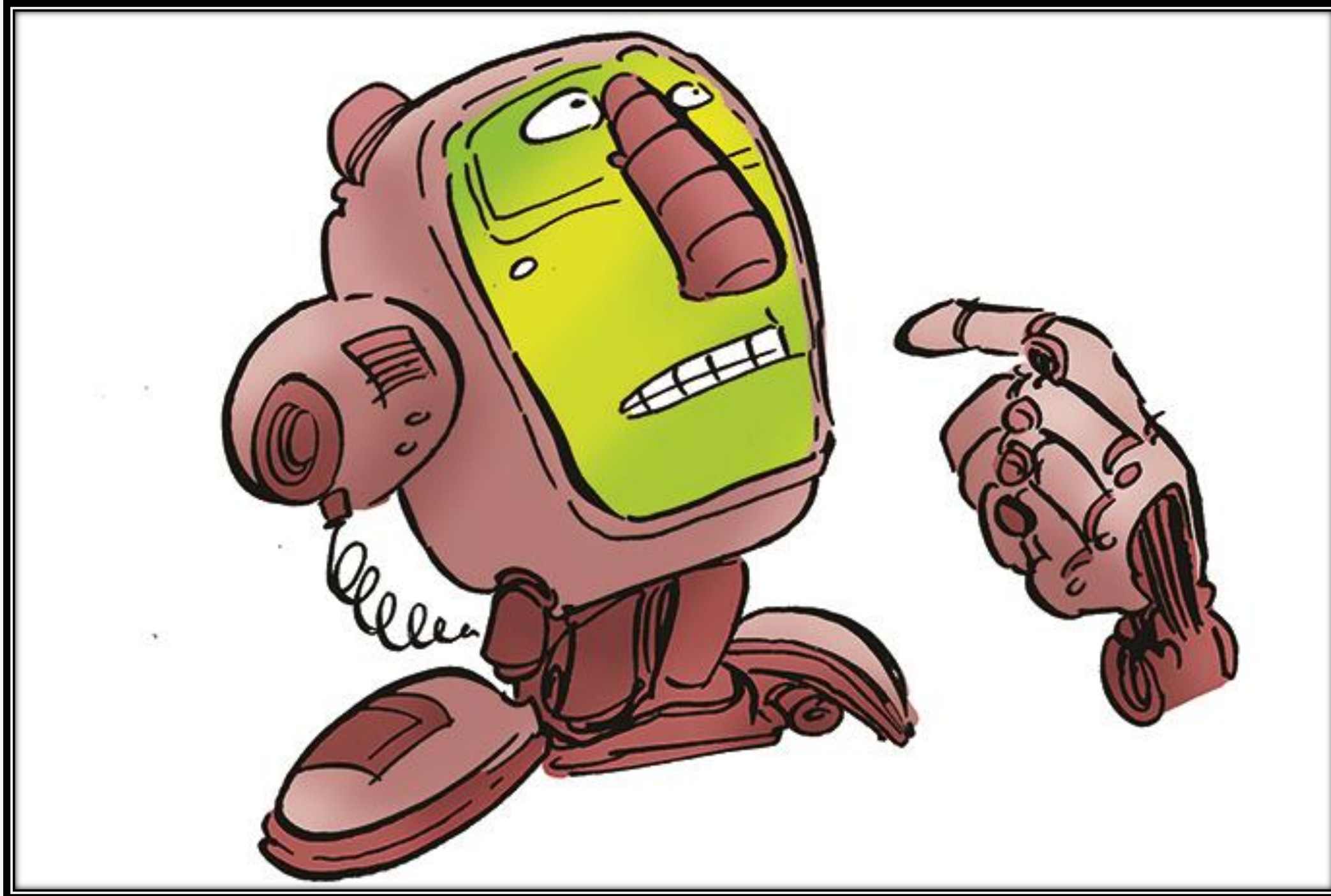
– and

Their appreciation of the natures of different disciplines/ways of knowing and how they interact to address different types of questions, including Big Questions

- Knowledge about knowledge – particularly questions, methods and norms of thought within disciplines and interaction between disciplines (teachable & assessable)
- Moving beyond topic work to recognising the distinctiveness of the disciplines (pedagogical approach)

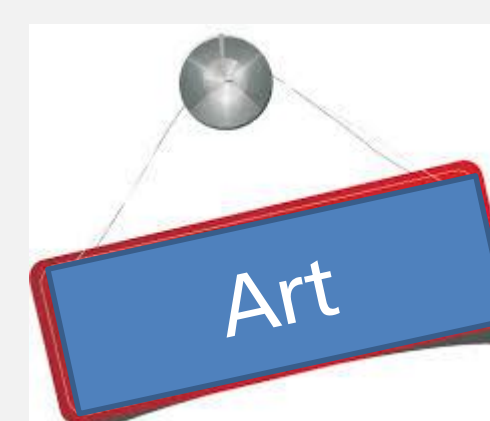
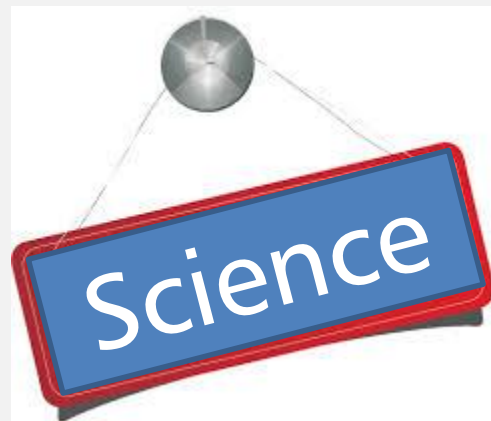
The EI initiative aims to develop students':

- Curiosity in Big Questions
- Understanding of different ways of knowing and how they interact – including science and religion
- Understanding of the power and limitations of science



- Questions about human personhood and the nature of reality
- Questions that span science, religion and the wider humanities
- *'How do we care for the world?'*
- ...
- *All knowledge disciplines can help!*

- Big Questions are usually multi-disciplinary questions.
- Big Questions are sometimes real life questions.
- Real life questions do not have label on them.



- *Can a robot have the status of a human being?*
- *How can we deal with environmental problems?*
- *What is the meaning of life?*
- *Why do we need plants?*



## I am being epistemically insightful when

- I can analyse a question and understand how my discipline can address the question in collaboration with other disciplines.
- I am not reducing the question into my compartment without acknowledging other aspects of the question.

## The Epistemic Insight Curriculum Framework

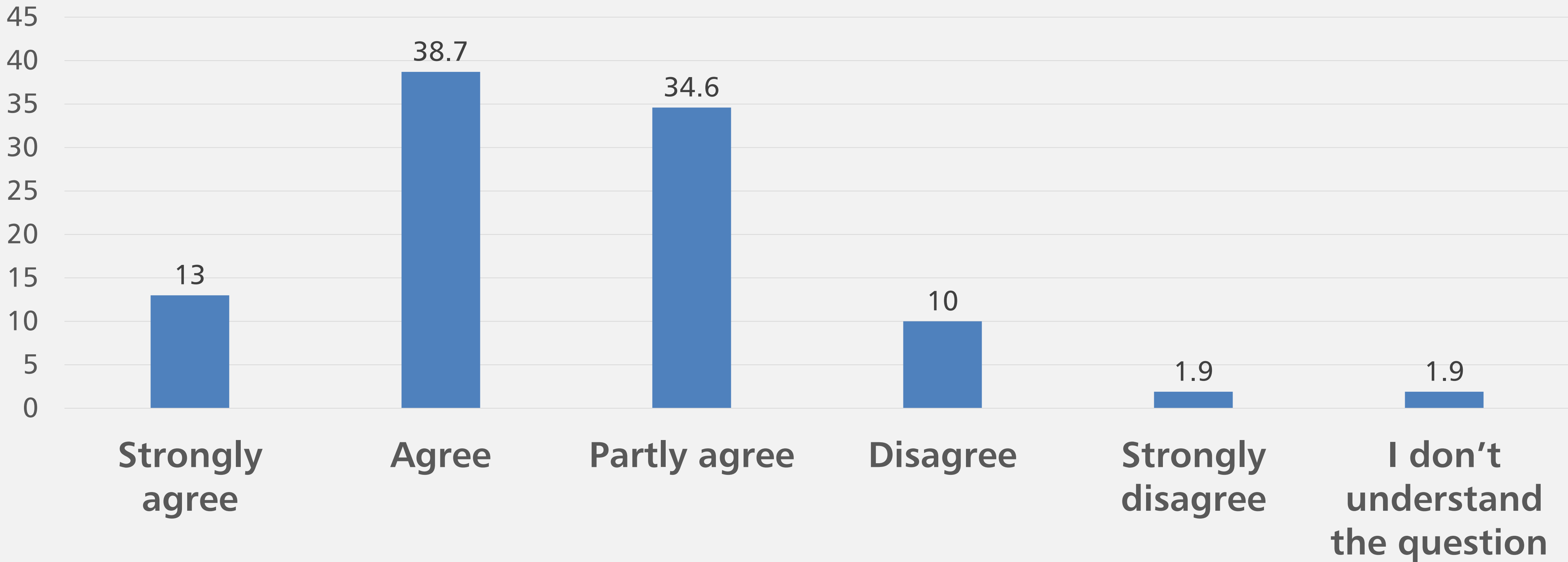


We use large-scale surveys to test hypotheses about systematic social and organisational pressures and barriers in schools and ITE (Initial teacher education)

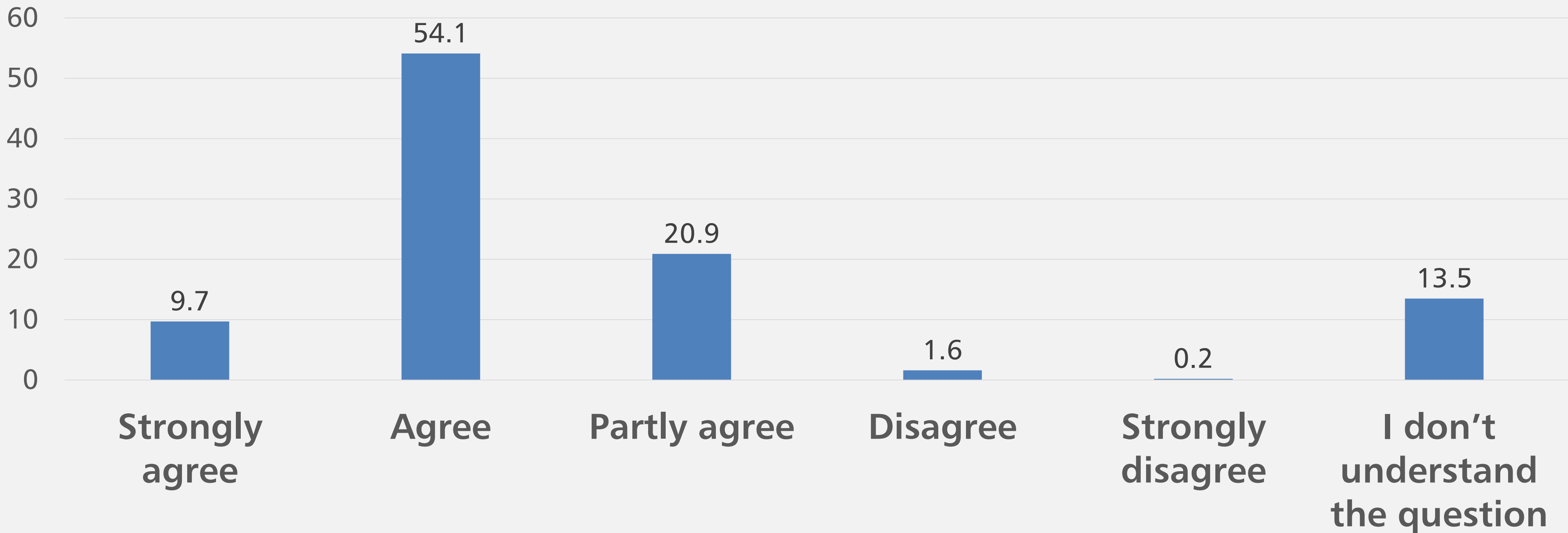
We also test our hypotheses that these pressures and barriers have the unintended consequence of preventing students' development of interdisciplinary epistemic insight).

Student teachers and young people are interested in Big Questions – and they are positive about the importance of learning about the natures of different disciplines.

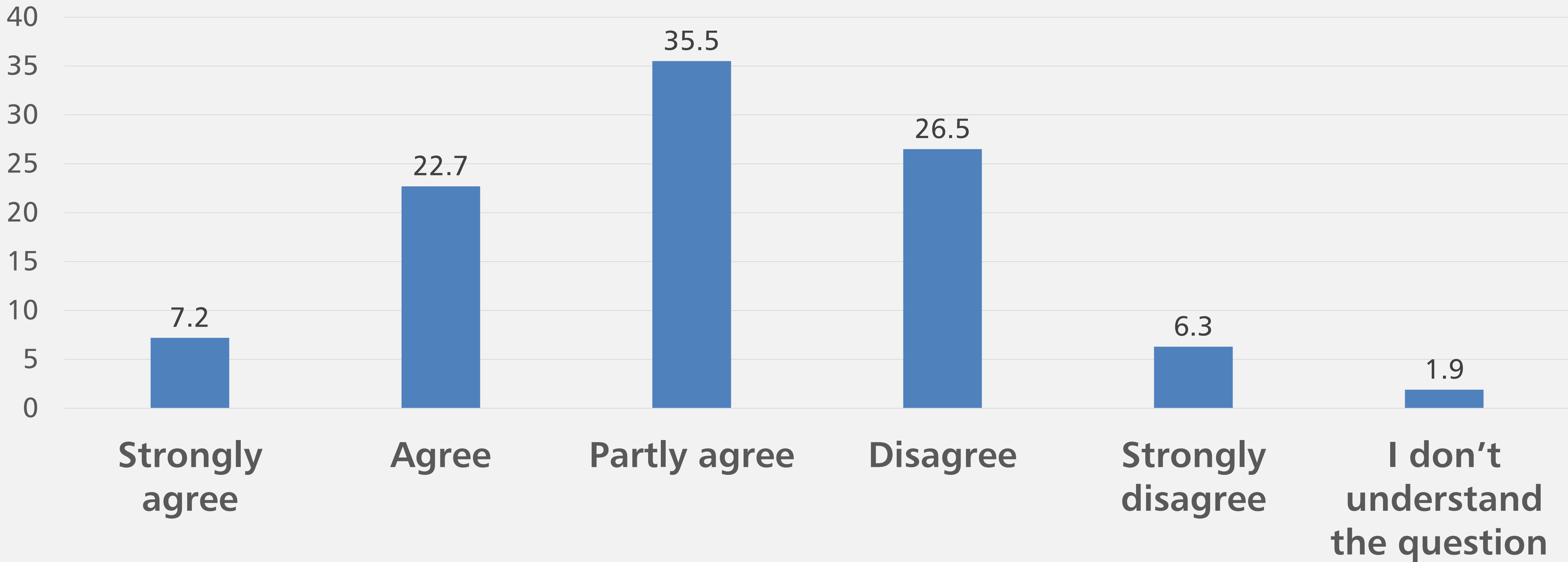
## I like to think about big questions (%)



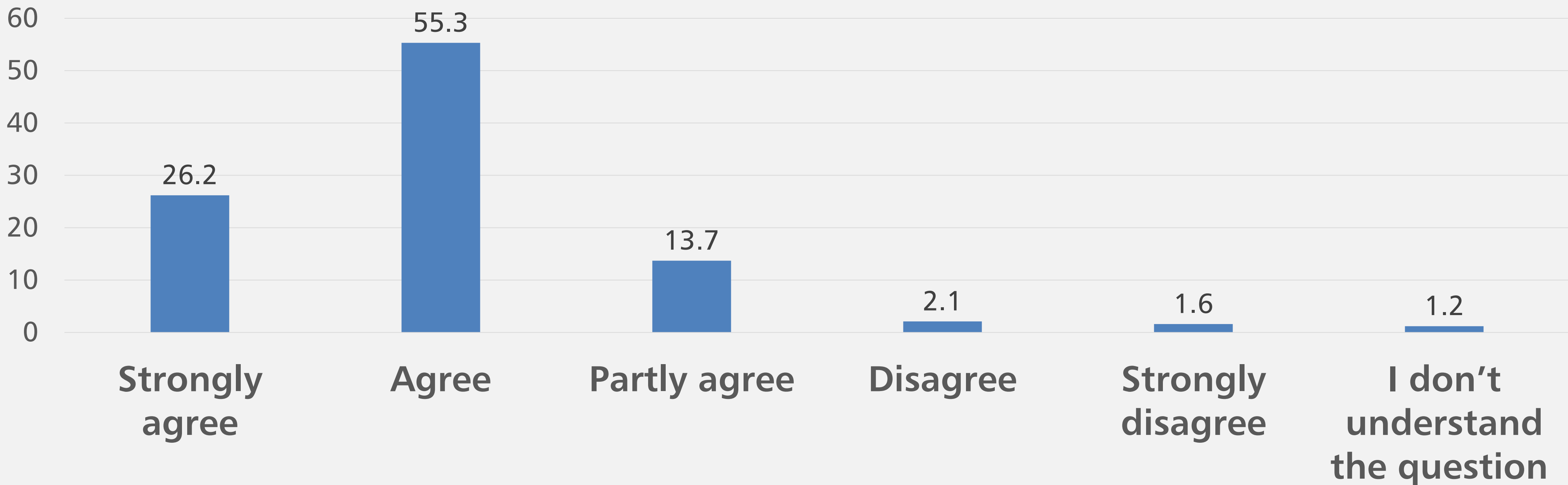
It is important for students to know about the similarities and differences between disciplines (%)



## As a child, I spent many hours pondering big questions (%)



## I would like to know more about how to teach about big questions





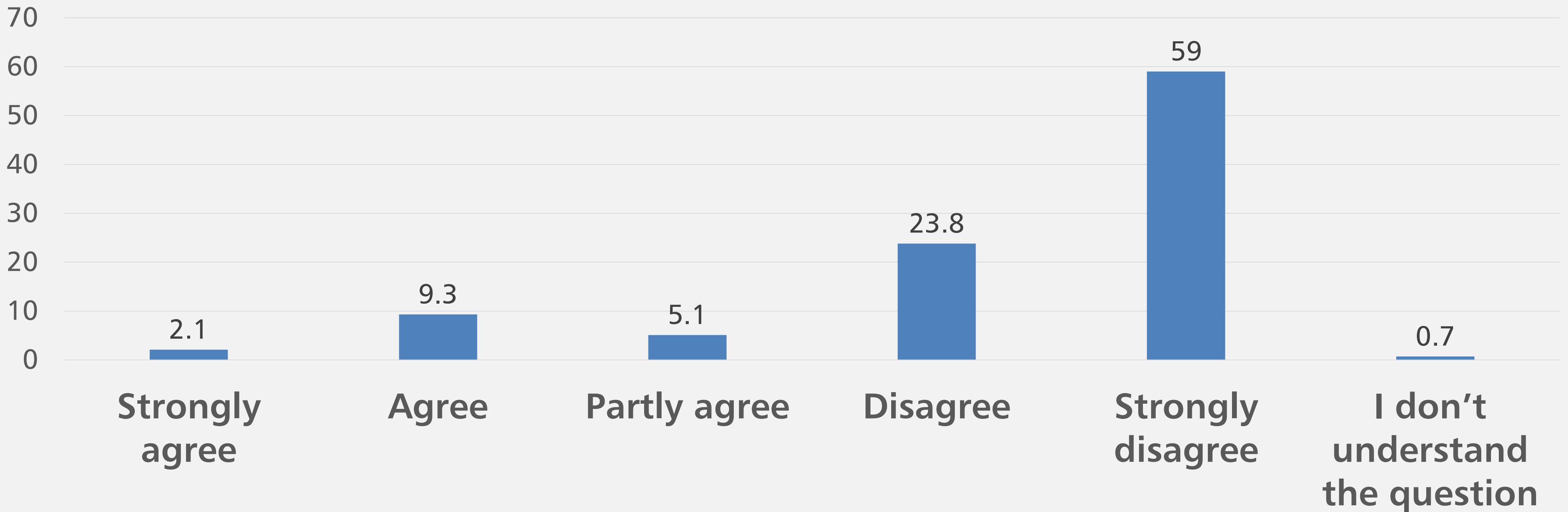
Our first hypothesis about a barrier to the development of interdisciplinary epistemic insight – is entrenched compartmentalisation of subjects in schools.

This is not the division of the curriculum into subjects and this is not teaching about knowledge through the lenses of disciplines – we support both of these!

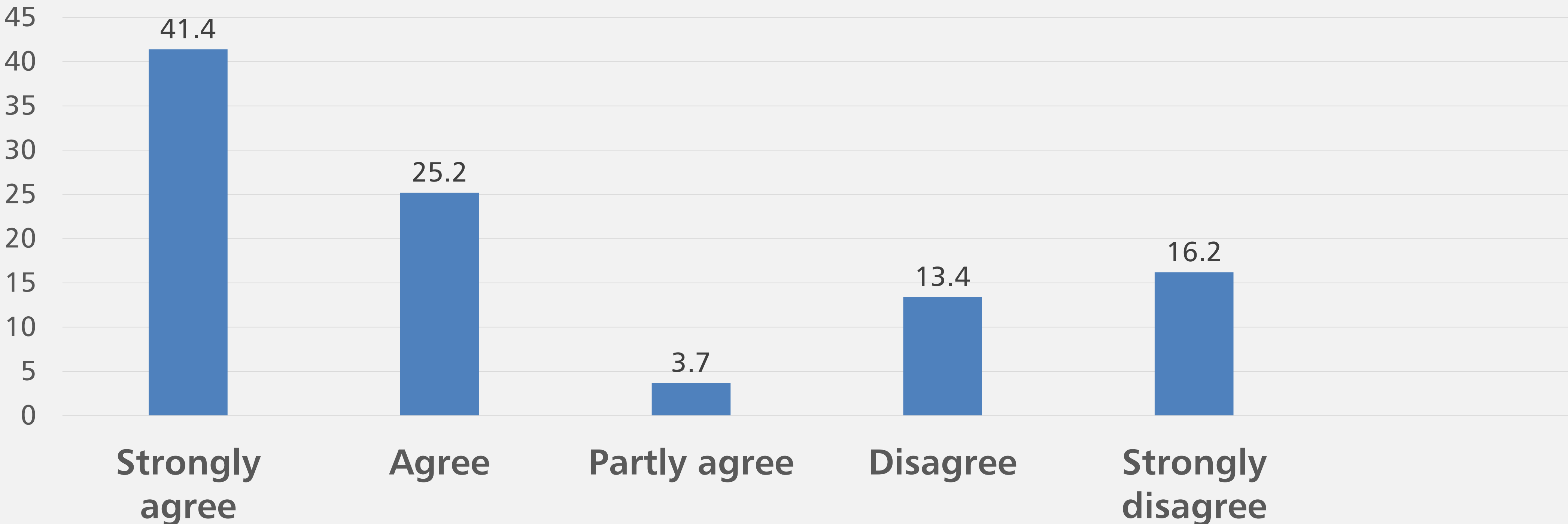
So what do we mean?

By entrenched subject compartmentalisation – we mean that for example a student can go through the whole of secondary school – without a lesson by two teachers from two disciplines explaining how their disciplines interact.

In secondary school, I had some lessons where the science teacher and a teacher of another taught the lesson together (%)



In secondary school, I never had a lesson where teachers from two separate subjects taught a lesson together



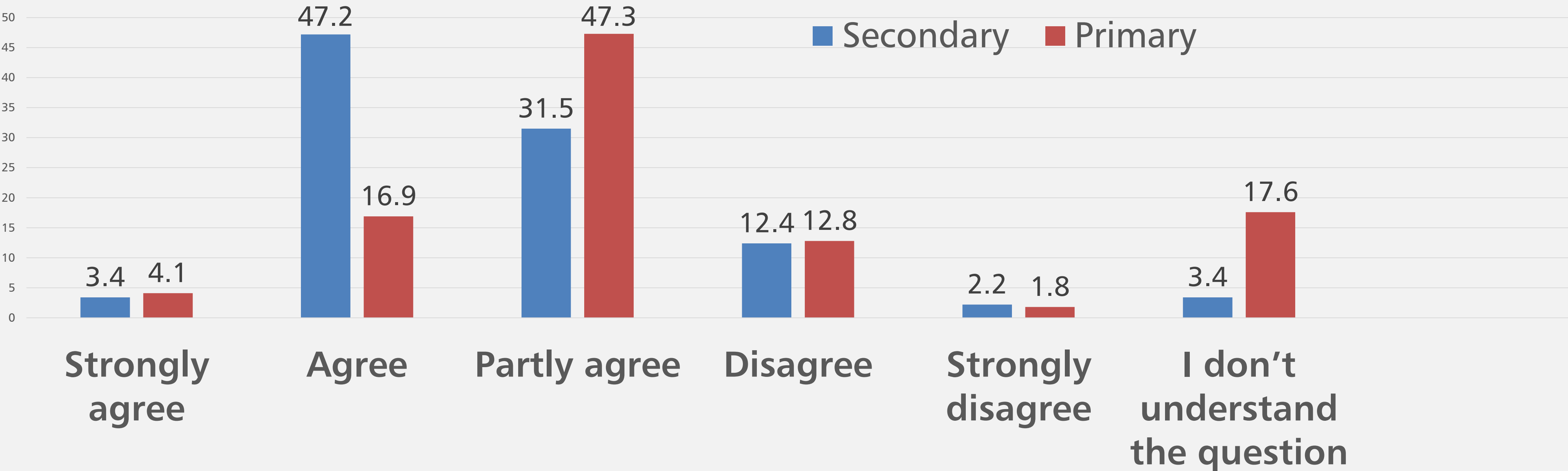
This has the unintended consequence of limiting the questions students meet – to those that are already amenable to each discipline. There is a risk of a misperception about the nature of knowledge – that questions readily fall into different disciplines.

We also create a gap whereby students are unlikely to meet cross-disciplinary questions or carry out enquiries into them. Analysing and addressing a cross-disciplinary question is an effective way to see what makes disciplines distinctive. – this lesson is missing



However ... many student teachers *say* that they have learnt – and can explain – ways that disciplines are distinctive – if we ask them. This is particularly true of secondary school trainee teachers

## I can explain the strengths and limitations of a range of disciplines.

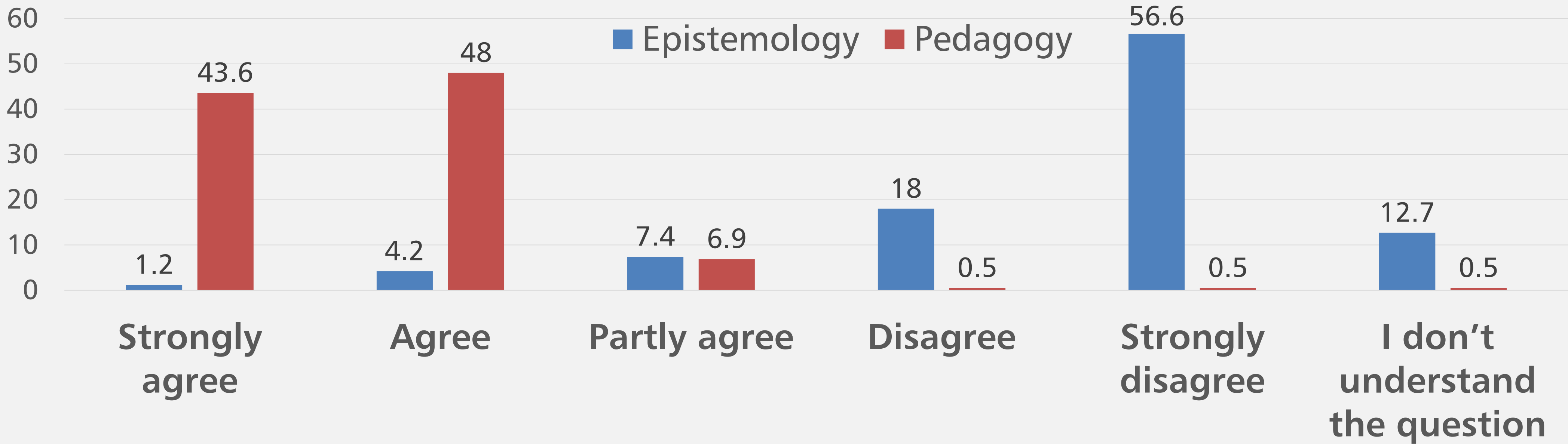


So let's probe further – to what extent is the term 'epistemology' introduced in teacher education?

As student teachers are at different points, we compare with 'pedagogy' – thus we know they are being taught 'pedagogy' – so is the teaching they receive about pedagogy including epistemology?



I am familiar with the term 'epistemology'  
I am familiar with the term 'pedagogy'

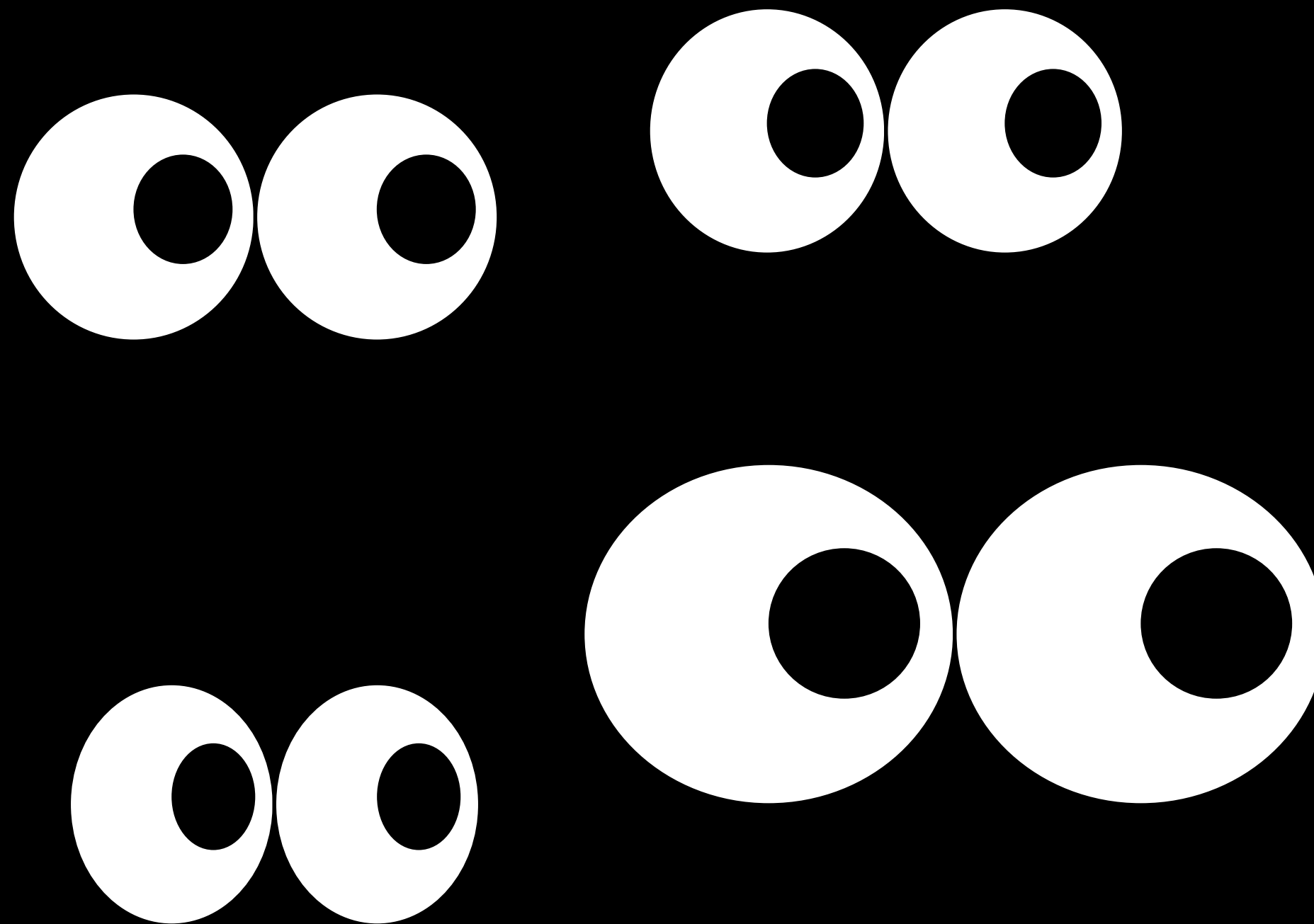


Our hypothesis is that there is very little teaching – in school or initial teacher education - about the distinctive 'self-limiting' nature of science – an idea that matters when considering science alongside other disciplines.

	<b>Science</b>	<b>History</b>
Key stage 1	20	0
Key Stage 2	31	0
Key Stage 3	7	0
Key stage 4	7	0
total	65	0

Counting how many times words associated with observe are in each curriculum: observe, observation, observable, observing

# **Pedagogy in school Science: Observations of objects and phenomena in the natural world**

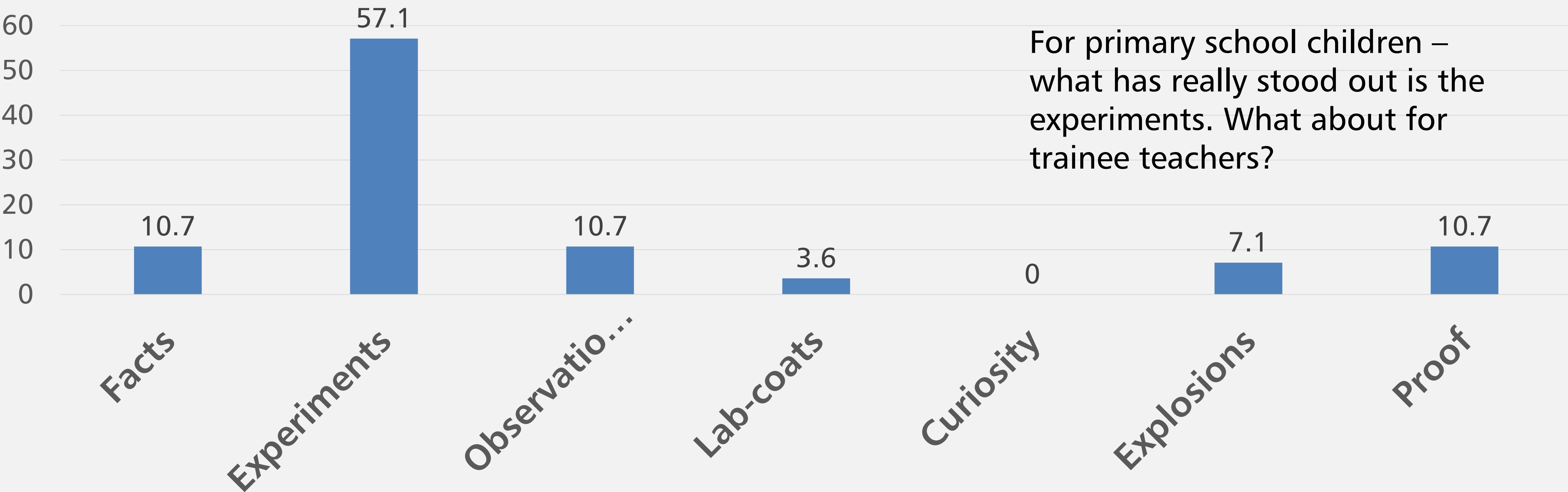


The survey has a list of characteristics of science that students often give us – and that the research says students often associate with science.

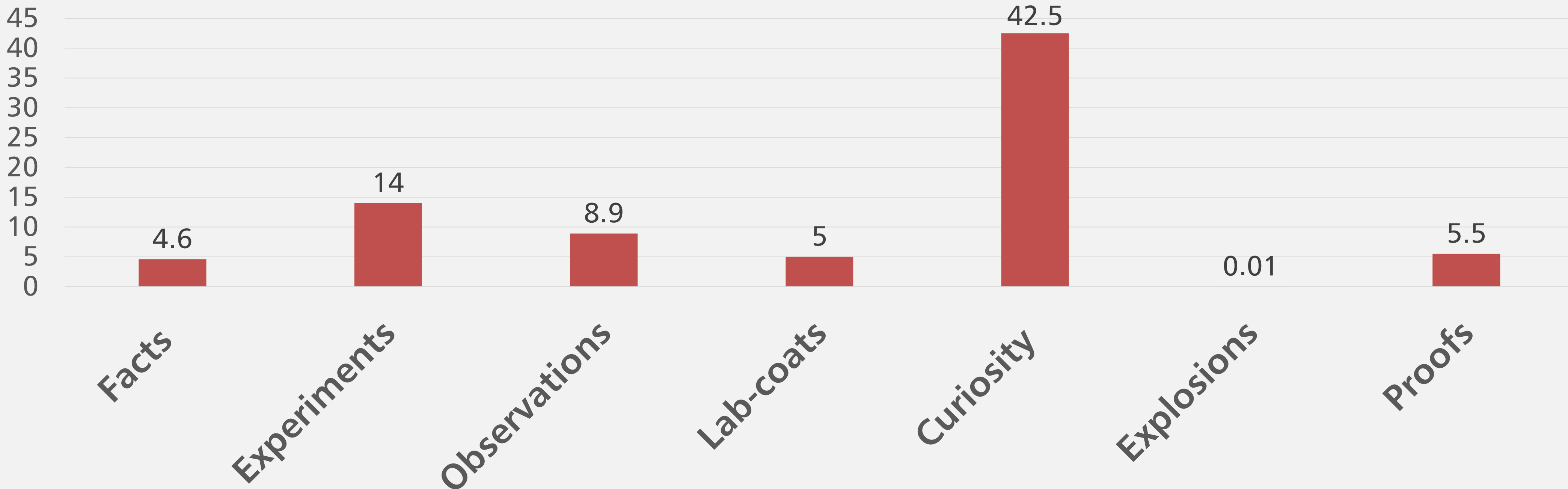
It includes 'observations' – something the NC identifies as essential and distinctive in children's experience of science at school.

Facts  
Experiments,  
Observations,  
Lab-coats,  
Curiosity,  
Explosions, Proof

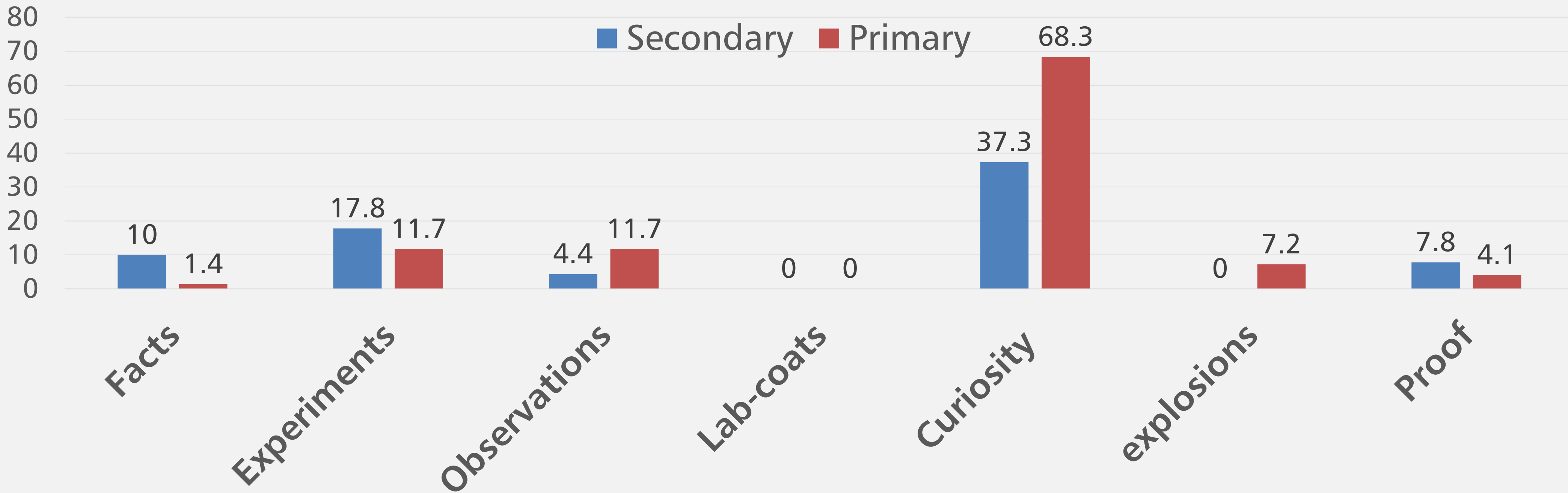
Choose one word below that is key to explaining the nature of science  
(N= 29, Primary school students)



Choose one word below that is key to explaining the nature of science  
(N=433, ITE Students CCCU)



Choose one word below that is key to explaining the nature of science

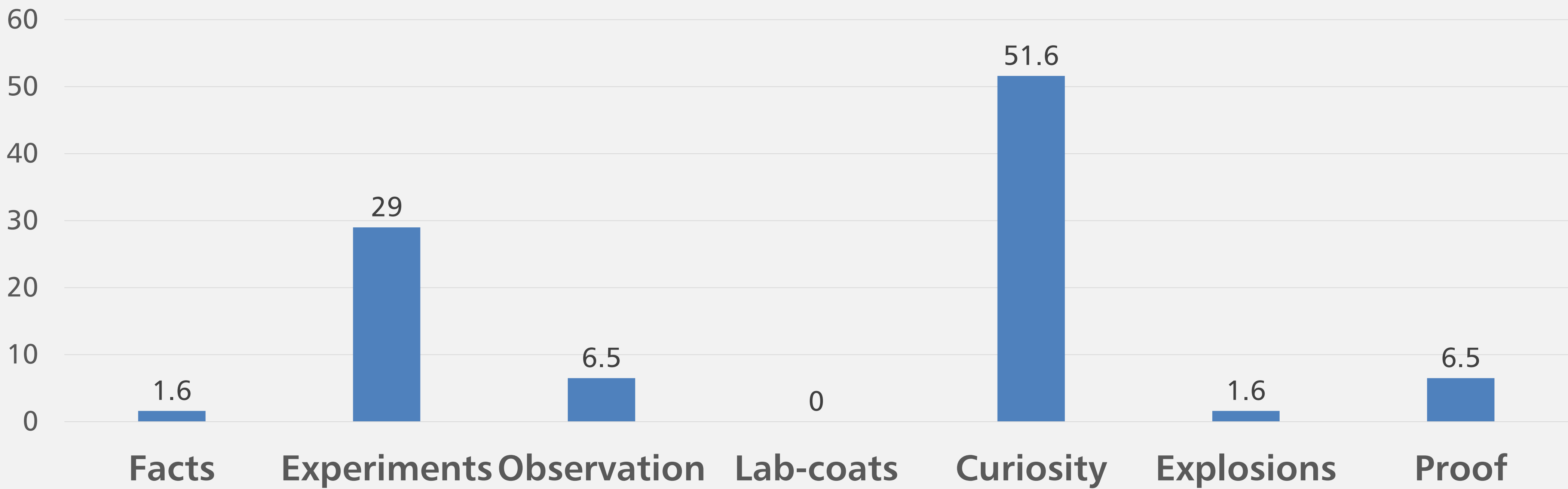




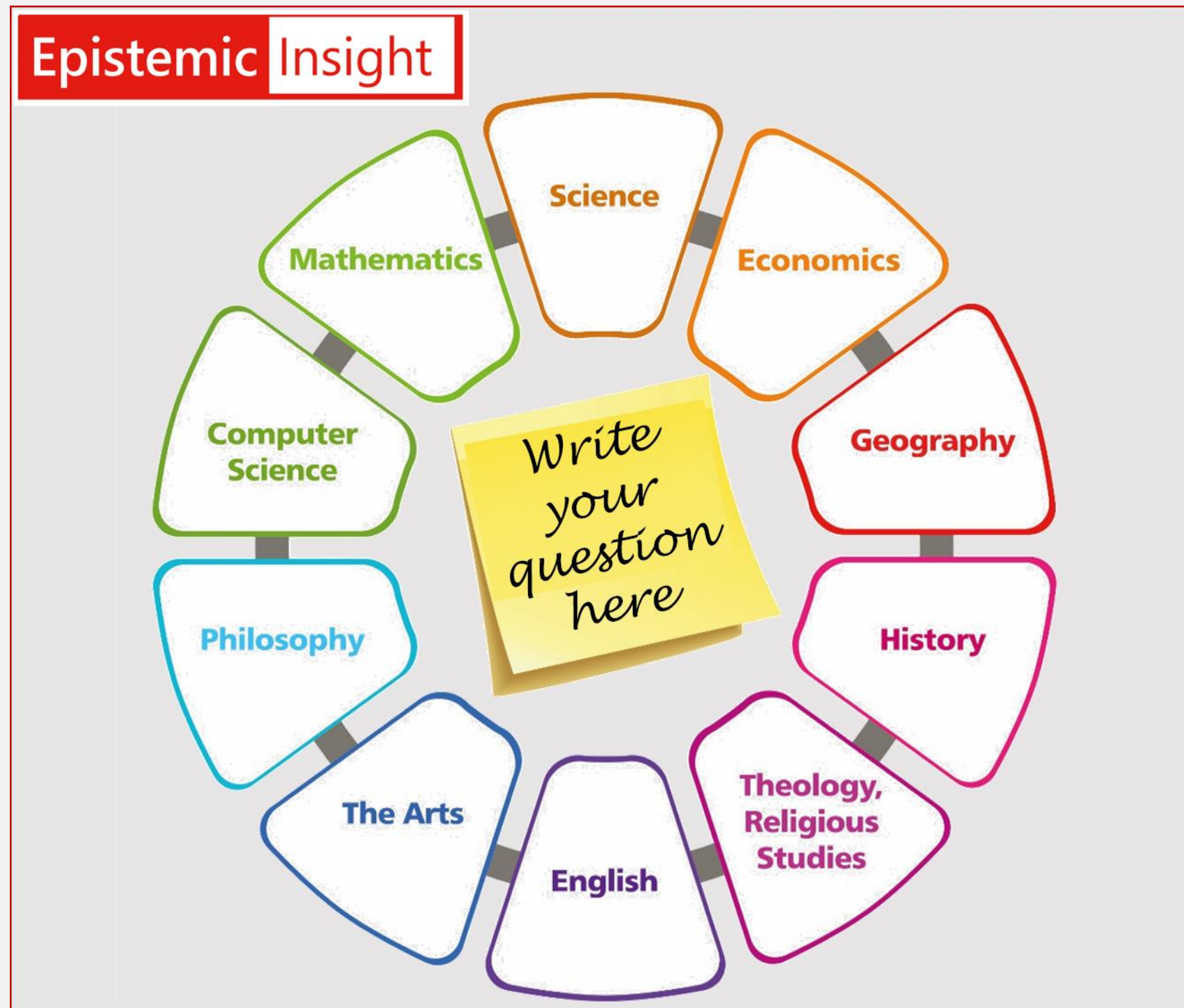
The pedagogical message to stimulate children's curiosity in science has swamped out the epistemological characteristic of what makes science distinctive – which one supposes is thus not being highlighted in the pedagogy.

This answer (curiosity) isn't "wrong" as such but it shows us that the focus in teacher education is on an aspect of science – curiosity - that one hopes is true in lots of disciplines/subjects. Eg in history we are 'curious about the past. It builds our case that there is insufficient attention on what makes science distinctive – and what makes a question a good one for science to address

Choose one word that is key to explaining the nature of science  
(ITE Students, University 2, N= 62)



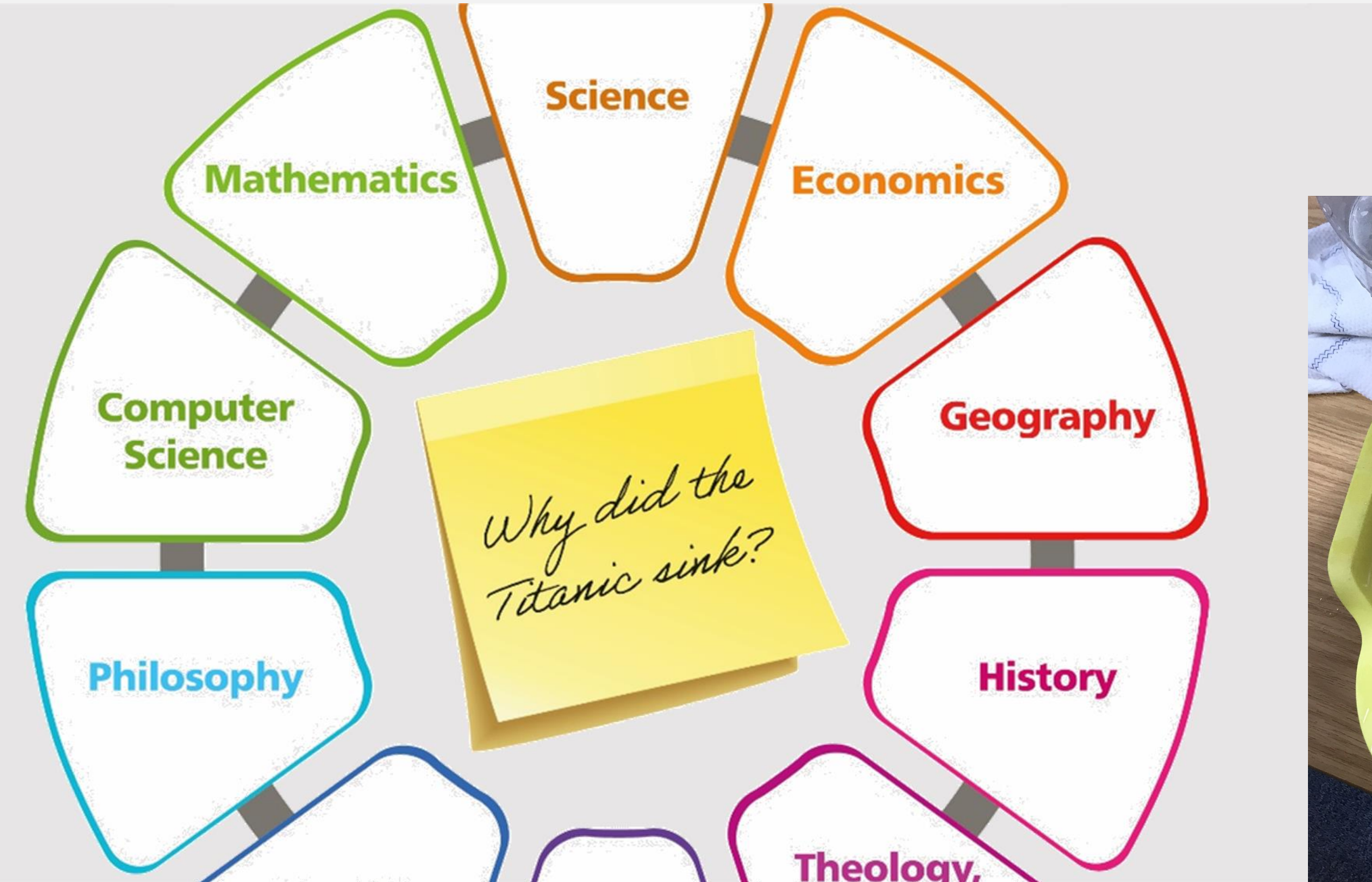
We give trainee teachers EI tools to include in their teaching. One is the 'discipline wheel' as a way to remind children that we can 'see' a question through several different disciplinary lenses and then 'add up' the insights they give us.

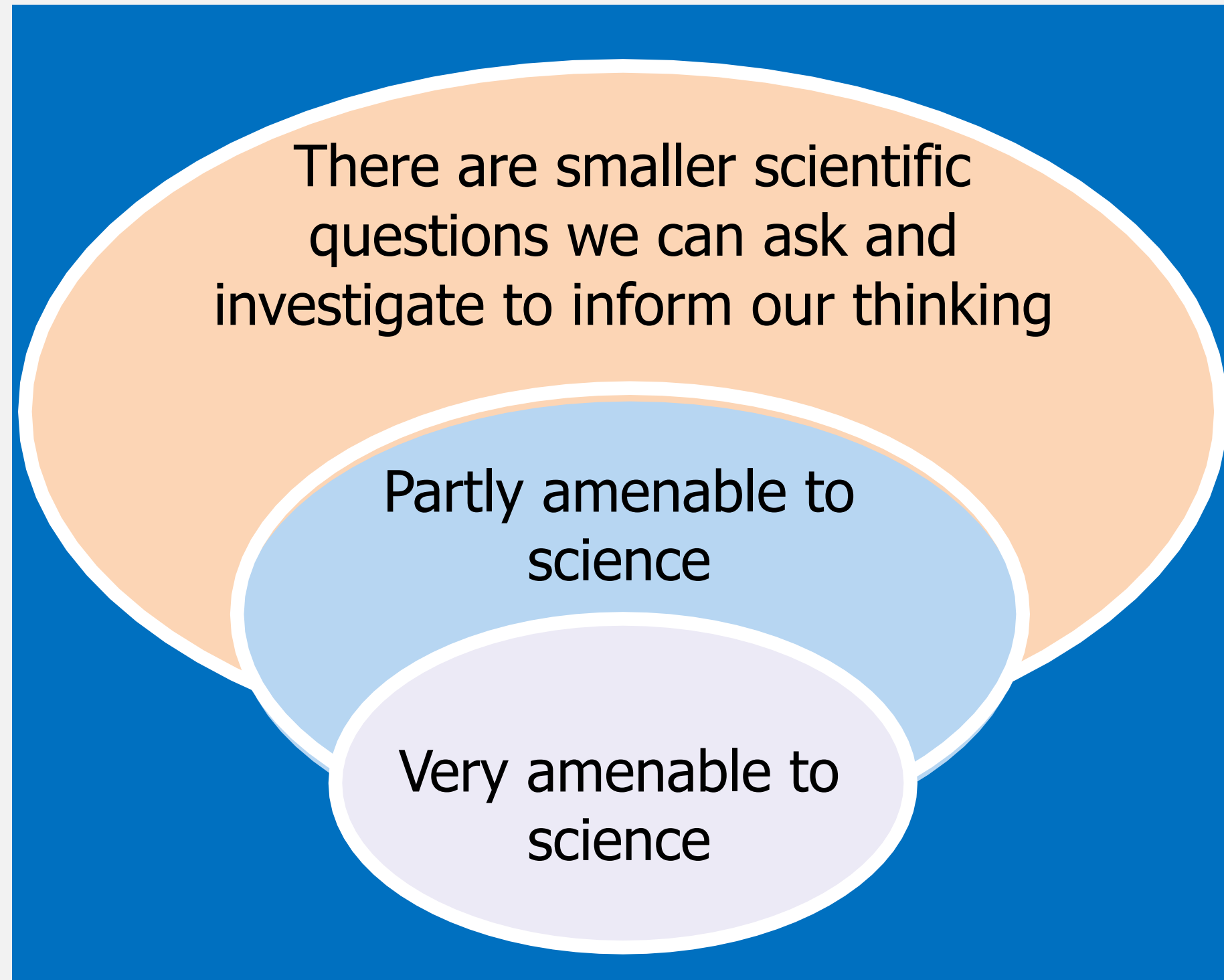


The question box has a 'bridging question' that the teacher designs to be addressed in two disciplines – for a comparison



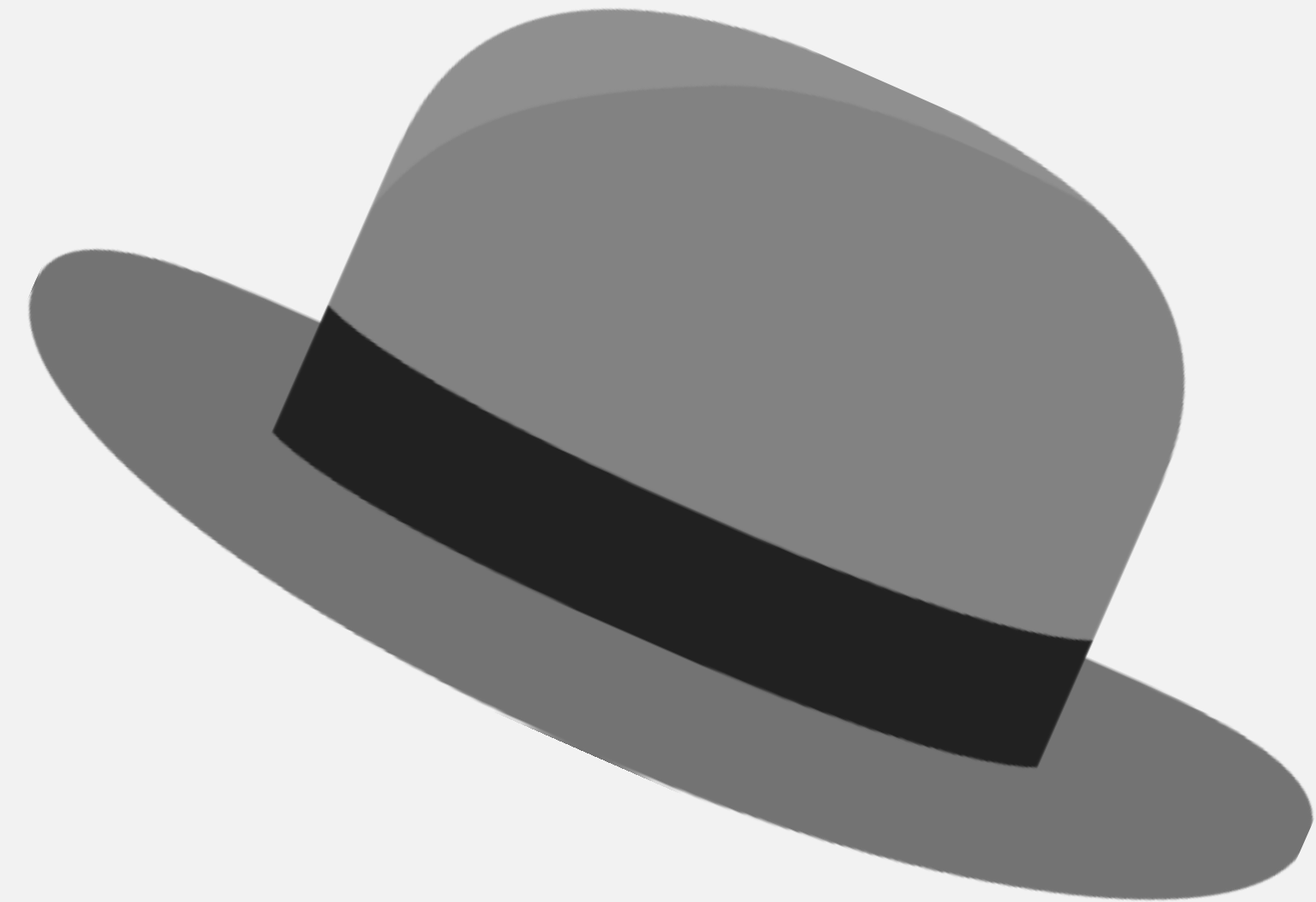
# Why did the Titanic sink?





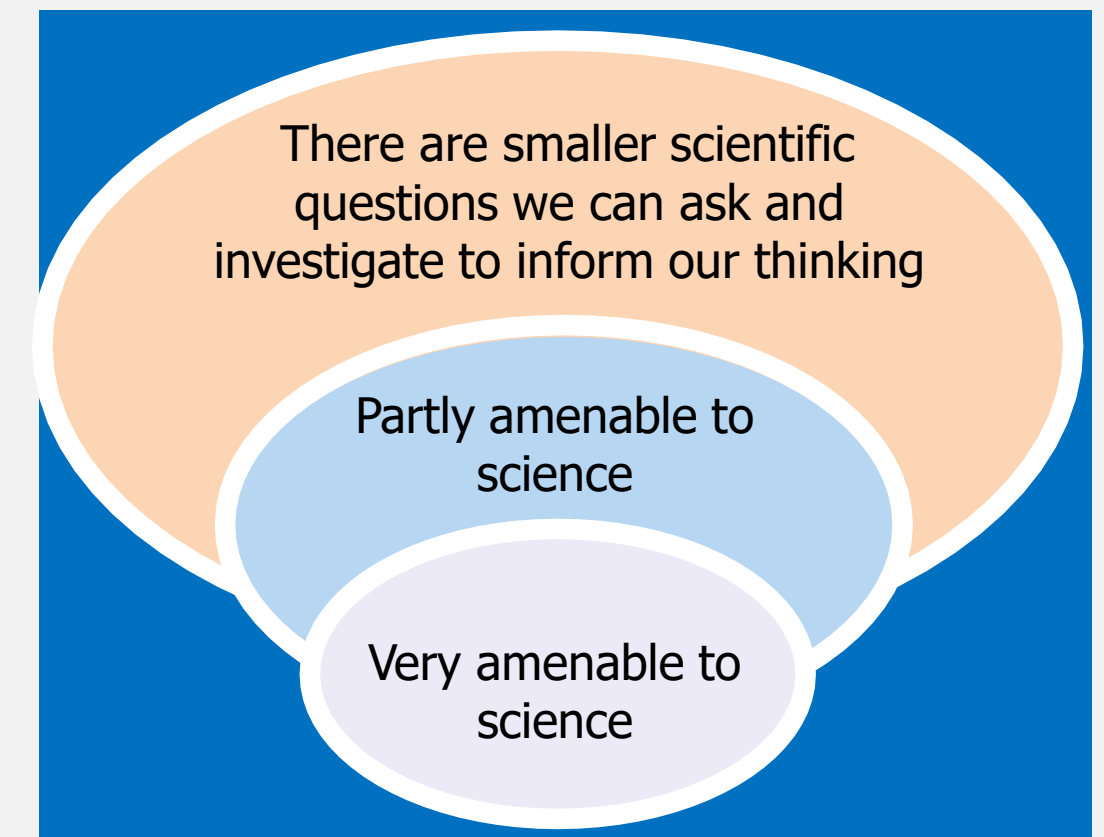
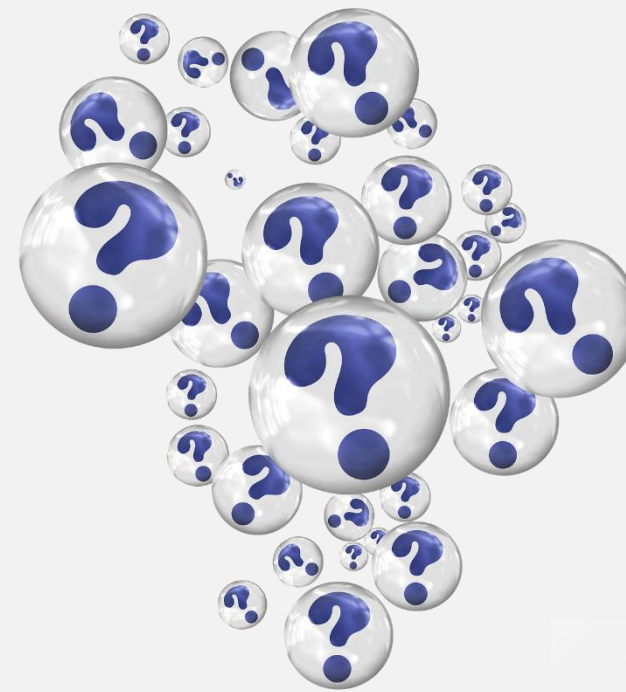
The 'Bubble tool' can be used to sort questions into those that are more amenable to science – and students can then look at their own examples to think about – what makes science (and a scientific question) distinctive

We can put on different scholarly hats – to think like a scientist, think like a historian etc.



Stepping stones to help pupils to understand how different disciplines work and interact.

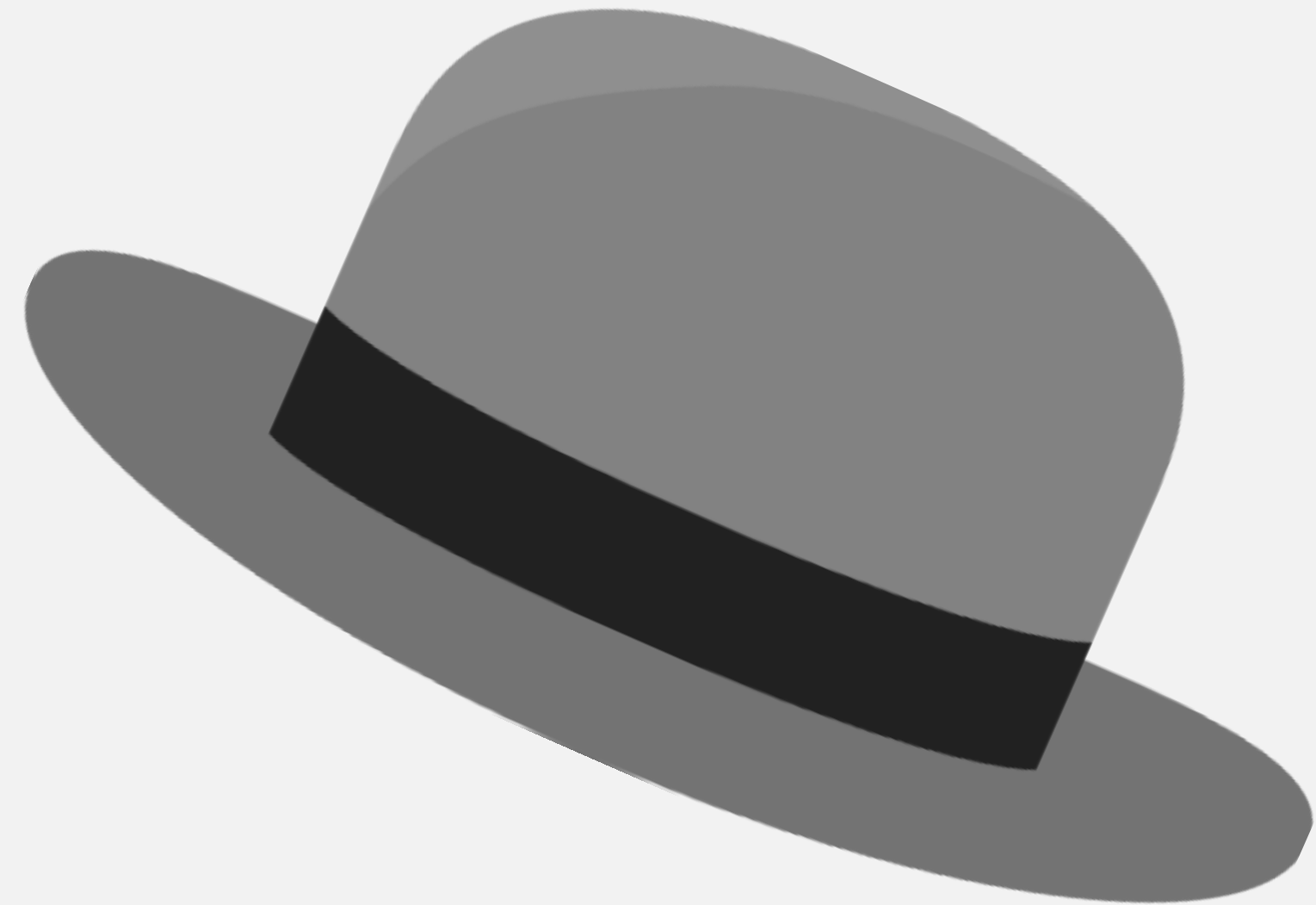
- Scholarly hats
- Bridging questions
- Discipline Wheel
- The Bubble Tool





We would like our trainee teachers to think about the impacts of their 'pedagogical habits' on children's understanding of knowledge.

Many of our trainees address this in a research assignment in school on placement



# Thank you

Questions and comments