Epistemic Insight

The Epistemic Insight Initiative

CPD Webinar 7: Essential Experience of Science: In the future will people travel and live in space?

www.epistemicinsight.com
LASAR@canterbury.ac.uk

@LASARCentre
#EpistemicInsight

Canterbury Christ Church University

Who is in the room?

0
EYFS/KS1 teacher or practitioner

1
KS2 teacher

0
Primary leadership

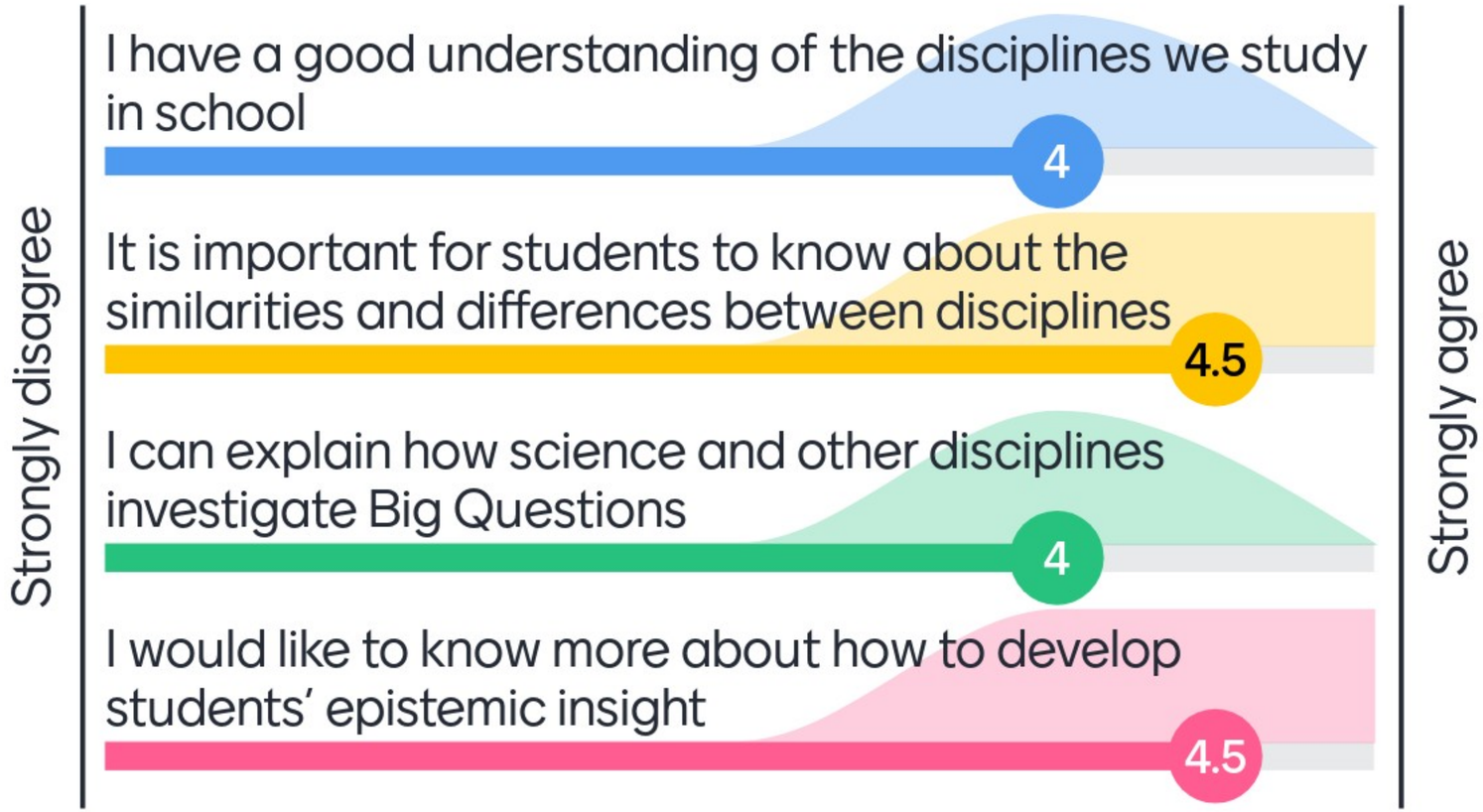
0
Teaching assistant

0
HE lecturer/researcher

1
ITE student (UG, PG, Schools direct)

0
Too unique for labels :)

I would be really interested in your responses to:



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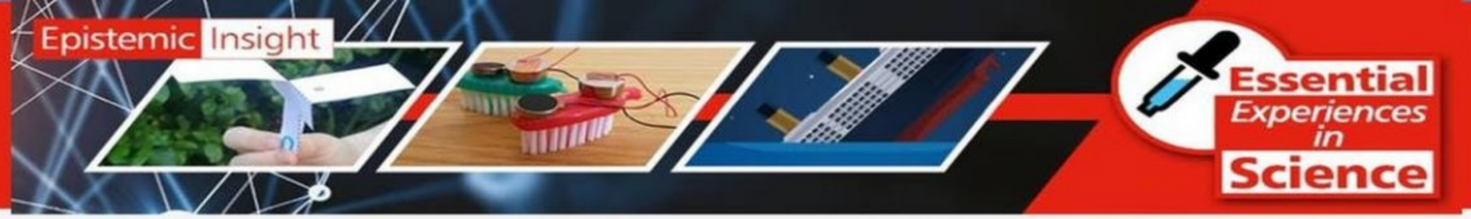
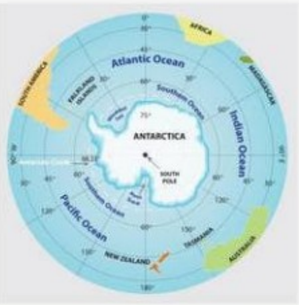


Essential Experiences in Science

In the future will people travel and live in space?

What is the session about?	To support teachers to explain how different disciplines investigate a question and how another discipline is different to science.
Research question in school	• I have learnt that science and history are disciplines. • Some questions can be answered by science and history together. • I can explain how science and history are similar and how they are different. • I can sort questions into different disciplines
National Curriculum content	Science: Y5 – Earth and Space History: A study of an aspect in British history that extends pupils' chronological knowledge beyond 1066
Support and free materials	1 investigation card, EI tools, CPD

- Bridging question
- Different disciplinary perspectives
- Similarities and differences
- Preferred questions
- Methods
- Norms of thought



Developing an epistemically insightful lesson

Three steps to plan!

1. Build on current practice
2. Developing students' epistemic insight
   - Questions – How does my/this discipline understand the question?
   - Methods - How does my/this discipline investigate the question?
   - Norms of thought - How would my/this discipline know it has a good answer? (what does my/this discipline value?)
3. Make links across the curriculum

Epistemic insight: teachable and assessible

Science Card

The science on the card focuses on describing the solar system through a scientific modelling activity, where Science can answer a smaller question "What does our solar system look like?"

Strengths and weaknesses

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Science Card

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In the future will people travel and live in space?

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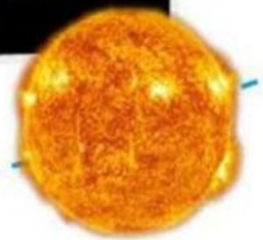
Let's use a scientific model to help us think about this question.



The Sun is the biggest object in our solar system, it is 696, 340 kilometres across, which is 109 times bigger than the Earth.

Imagine if we reduced the Sun down to the size of a full stop, what distance would all of the planets in our solar system be from the Sun and one another?

Would it be possible to carry enough water and food for such a long journey?

How would we power our space ships?

Currently, it would take six months for a rocket to travel from the Earth to Mars, so how long would it take to get to the other planets.

Planets	Actual Distance from Sun (in million km)	Relative Model Distance (in cm)
Mercury	58	5.8cm
Venus	108	10.8cm
Earth	150	15cm
Mars	228	22.8cm
Jupiter	778	77.8cm
Saturn	1420	142cm
Uranus	2870	287cm
Neptune	4480	448cm

On a piece of paper put a full stop and write **The Sun**. On eight other pieces of paper put the names of the planets listed in the table.

Across your floor, use the table to measure the **relative model distance** to each planet from your full stop Sun. Place each planet's label at the measured point.

What do you think? In the future will people travel and live in space?

Use your full stop model to help you think about your concerns and ideas about space exploration. Add your ideas to the thought diagram started above.

You could also think about the strengths and weaknesses in the full stop Sun model.

- The answer focuses on the scientific model to describe the sun, earth and moon as approximate spherical bodies and how the sun is centre of our solar system.
- These types of questions can be investigated through observations.
- Does it answer, "In the future will people travel and live in space?"

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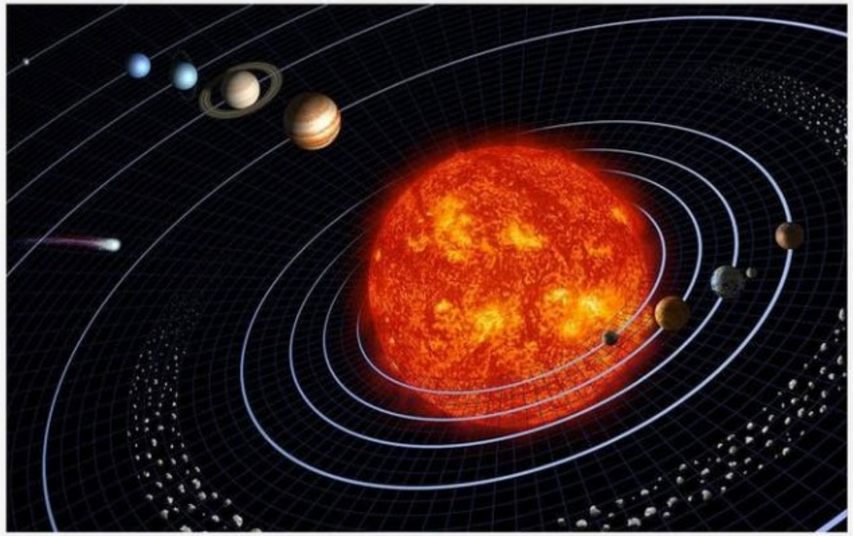
Being a science scholar



Science prefers to ask questions which investigate the nature of the world around us?
"What does our solar system look like?

Science preferred methods:
Investigate through observation.
Undertake measurement to test hypothesis

Science norms of thought (what science values):
A consensus about the results
Results allow accurate predictions
Results are objective

In the future will people travel and live in Space? What other questions could children ask about this?

What will transport look like in the future?

Maybe depending on if there would be a way to surive there.Children may ask: How would you survive? What with food production look like?

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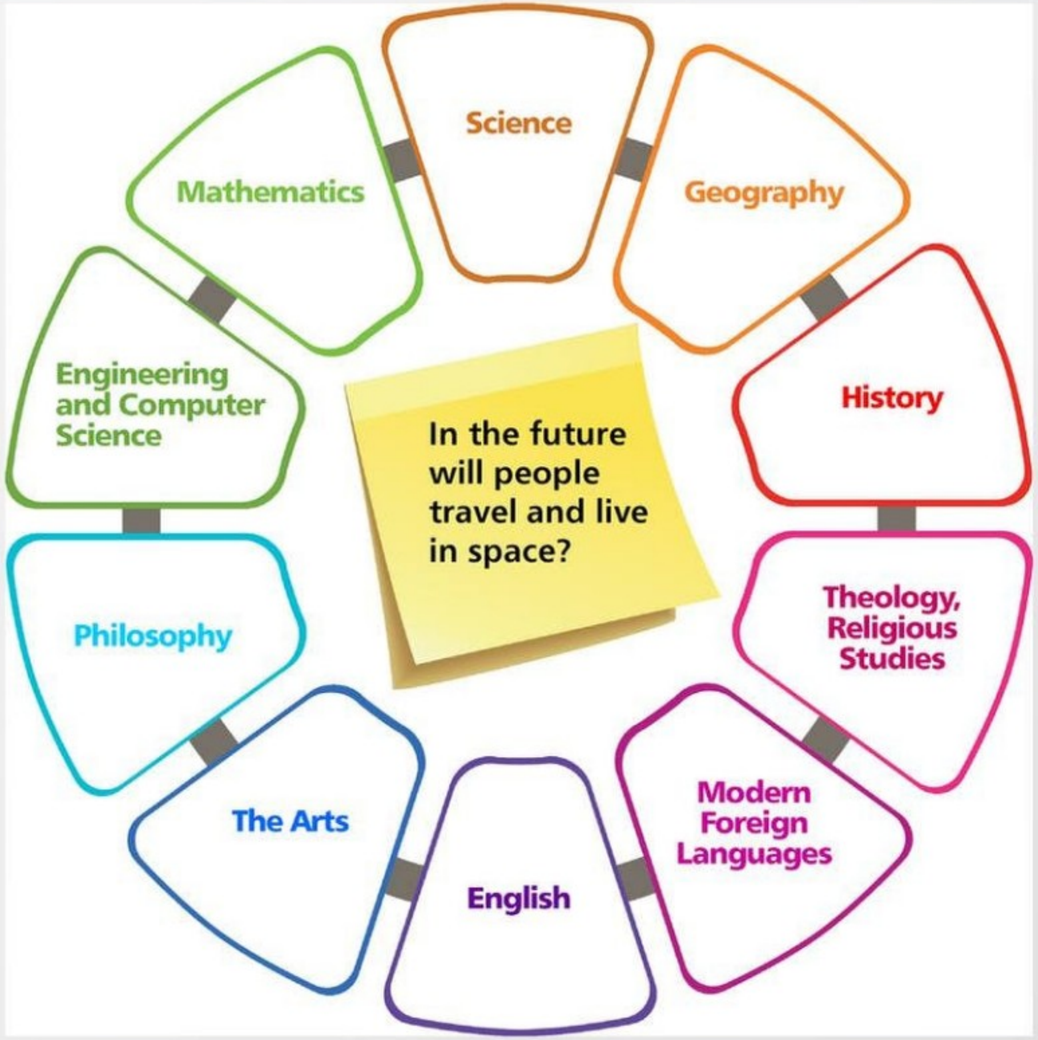
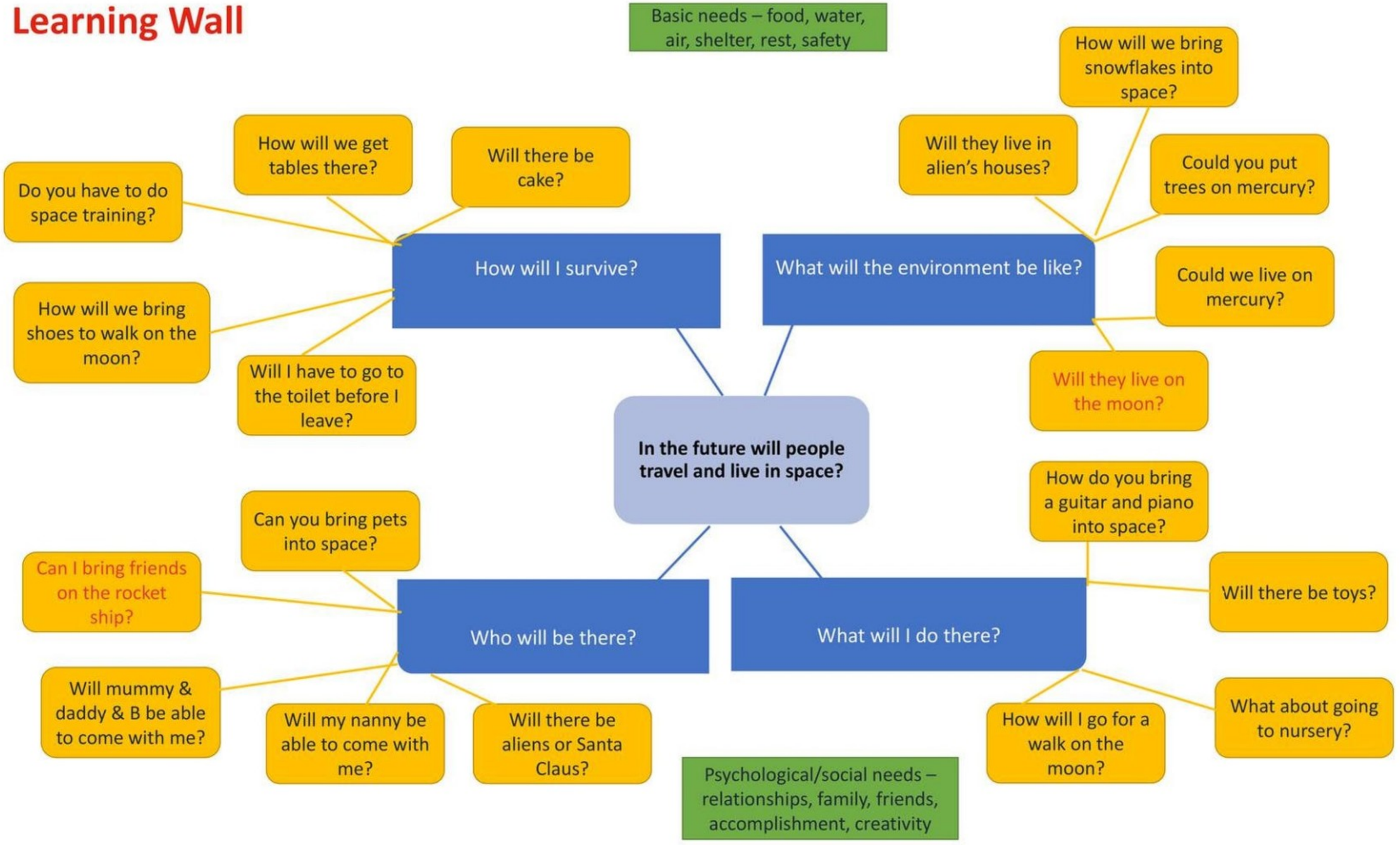
Discipline Wheel



State your question again this time identify which discipline likes to answer this question and why?

What would food production look like? Science, Geography, maybe History because of where it is and the history of the area

Learning Wall



Epistemic Insight 1. History – using the card epistemically

In the past 60 years we have certainly achieved a lot in space exploration. Probes have been sent out into space, and humans have orbited the Earth in space stations and even gone to the moon.

Example

- History could respond to the smaller question "How have humans explored space?"
- The answer focuses on the roles of different people and what they did during space exploration.

- A range of sources from the past and thinking about the bias and purpose of diary entries, personal accounts, reports, newspaper reports…

2. A second investigation – Why did Amundsen beat Scott in the race to the South Pole?

Example

Box 1 Investigating which material is the best insulator

Resources: Three plastic cups, a thermometer, two fabrics (one thick and one thin), sticky paper/tape, a stopwatch, scissors.

Method:

1 Secure the fabric around two cups using the sticky paper or tape to secure and the scissors to cut to size. Leave one cup uncovered.

2 Fill the cups with hot water from the tap and record the temperature of the water in each cup using the thermometer.

3 Start the stopwatch and take the temperature every two minutes for half an hour.

4 Record the findings in a table:

Time (mins)	Thick fabric cup (temp/°C)	Thin fabric cup (temp/°C)	Non fabric cup (temp/°C)

Science answers the smaller question

"Which material is the best insulator?"

- Investigated first-hand
- It is observable through a simple experiment.
- Measurements are taken.
- Results can be repeated and recorded.

History answers the smaller question

"Did Scott's expedition fail because of bad planning?"

- The answer focuses on the roles of different people and what they did during this exploration in a harsh natural environment.
- These are investigated by looking at a range of sources from the past and thinking about the bias and purpose of diary entries, newspaper reports…

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Being a history scholar

History prefers questions about people and events from the past:

"Did Scott's expedition fail because of bad planning?"

History's preferred methods:

Investigate through examining sources
Select and organise relevant information
Seek an accurate account

History's norms of thought (what history values):

Check sources for bias and motive
Results help understand our present/future
Results are subject to interpretation

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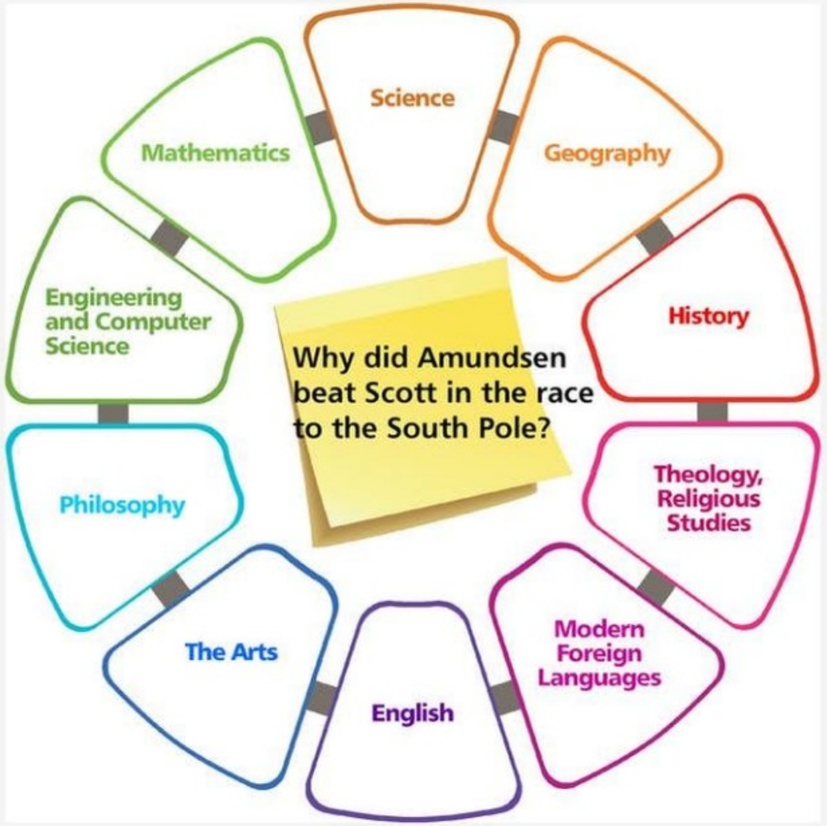
Being a scholar – Can they sort the disciplines

Science

- Observe
- Experiment
- Test
- Predict
- Measure
- Repeat
- Agree
- Scientific evidence



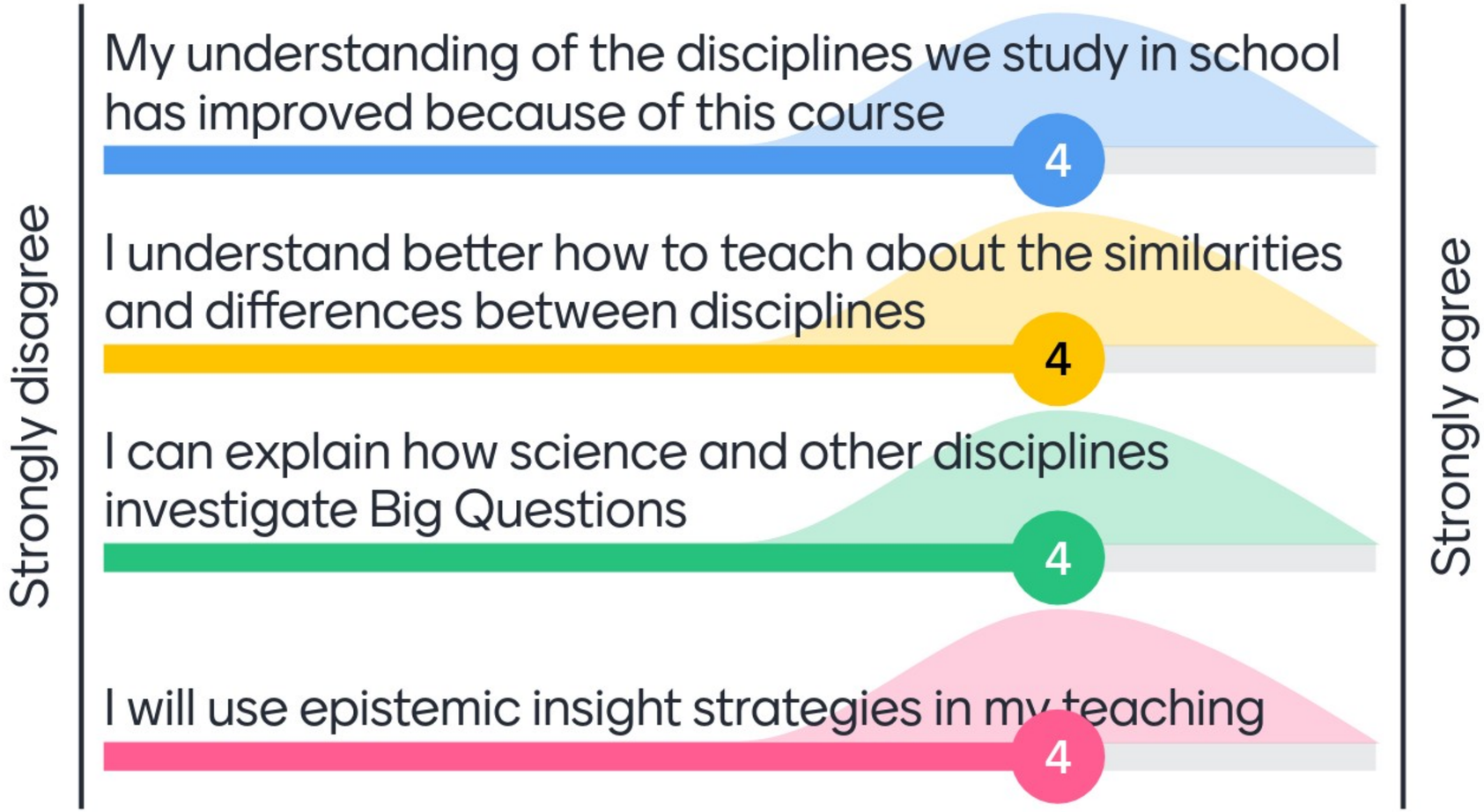
Epistemic insight: is teachable and assessible

History

- Collect, organise, interpret
- Who and where were the story tellers?
- Sources
  - People's stories
  - Newspapers
  - Reports
  - Books
  - Objects
- Historical evidence

How are the methods similar or different?
How do we make a better answer? Could we look at other disciplines?

How will you respond?



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Essential Experiences in Science

Exciting new scheme for Years 4-7 which address National Curriculum topics.
Free resources and equipment to share with 30 schools.
Starting with these Free webinars and some downloadable resources.

When: The project will run from now until the end of the year - stay as long or not - as you like!

What's on offer: Free printed investigation cards, free resources and equipment with opportunity to attend free CPD webinars and to ask for support from local Epistemic Insight research lead. Plus some opportunities for teacher bursaries.

Why: By getting involved in the scheme, children in your class will be doing hands-on science enquiry.

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What do teachers do: We are asking teachers to use these free resources and to give the children in their class a short before and after survey, with headteacher consent. (Also open to trainee teachers on placement with supervisor support)

What we will do: Support the teacher with the investigations through the CPD webinars and development of their own lesson plans. Contact Lasar@canterbury.ac.uk.

How do I get involved: Book onto as many of the webinars as you like through: https://www.eventbrite.co.uk/o/lasar-centre-at-cccu-30754621852 and contact Lasar@canterbury.ac.uk, if you are interested to be a teacher researcher in your school.

Join our teacher researchers: Survey your class before/after a card investigation. Gain free resources and equipment (Headteacher consent required)

Name

Email address

School address or ITE tutor group

Essential Experiences in Science: Grip or Slip	https://tinyurl.com/Grip-or-Slip	7th December
Bridging questions: What do maps tell us?	https://tinyurl.com/What-do-maps	14th December

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Next session: 7th December

Can it ever be good to slip?

This session will explore the essential science enquiry of **Can it ever be good to slip?** Which will be expanded to consider a bridging question Why are bowling alley shoes so slippery? which focuses on the disciplines of **science** with sport to investigate friction to develop students' understanding of science in real-world contexts and multidisciplinary arenas.

- Preferred questions
- Methods
- Norms of thought

Free investigation cards, materials and teacher notes available – help us research this question in your classroom!

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