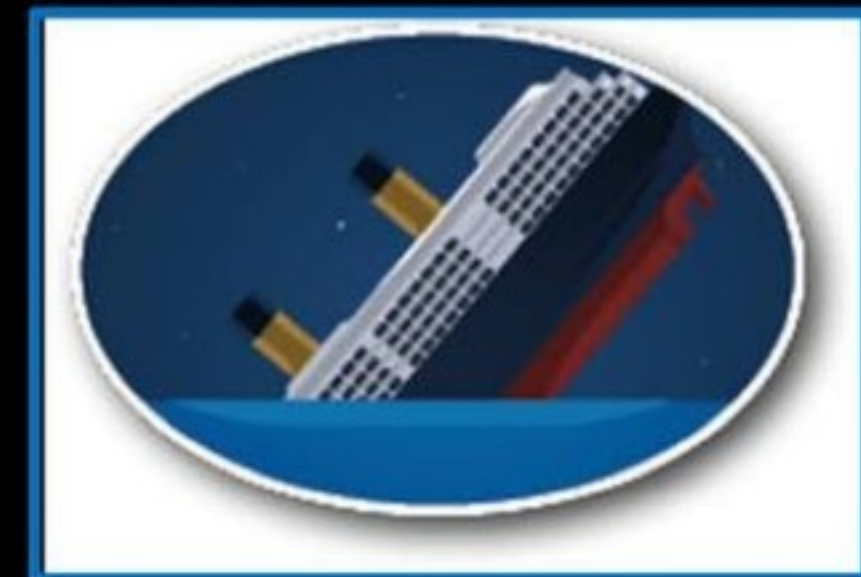




# The Epistemic Insight Initiative

**CPD Webinar 4:  
Essential Experience of Science:  
Why did the Titanic sink?**





# Who is in the room?



0

EYFS/KS1 teacher or practitioner



KS2 teacher

0

Primary leadership

0

Teaching assistant

0

HE lecturer/researcher



ITE student (UG, PG, Schools direct)

0

Too unique for labels :)

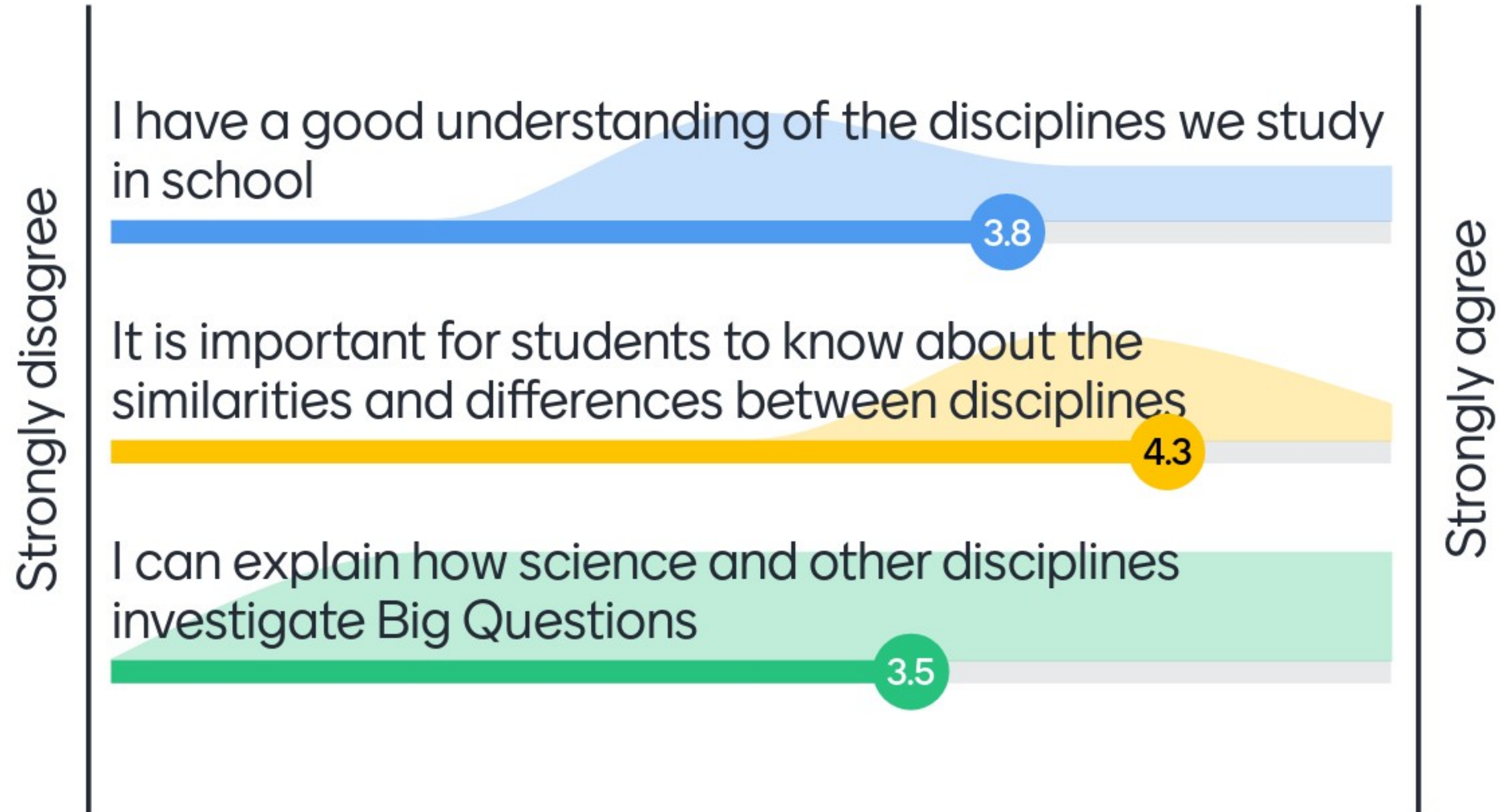




# I would be really interested in your responses



to:





Teachers can support students to answer three questions:

1. **How does a discipline interpret the question?**
2. **What methods would this discipline use to investigate the question?**
3. **How would a scholar of this discipline know they had a good answer? (What does the discipline value?)**

I can think like a scholar when I can:

- ask a valid question for my discipline!
- recognise a question my discipline likes to answer!



Lets look at the bridging question. **Why did the Titanic sink?**  
Is this a good question for science to answer?





# Why did the Titanic sink? What discipline(s) could give a good answer? Explain your rationale.



Research (it's already known),  
modelling to try it out

STEM - thinking about how the titanic  
was built and the science behind why  
it sank

Know though historical facts,  
experiments to prove the theory.

History - perspectives of those  
aboard the ship

Science - climatic factors





## 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?
3. Make links across the curriculum





## Why did the Titanic Sink?

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	<ul style="list-style-type: none"> <li>• I have learnt that science and history are disciplines.</li> <li>• Some questions can be answered by science and history together.</li> <li>• I can explain how science and history are similar and how they are different.</li> </ul>
National Curriculum content	<p><u>Science</u>: Y5 - Forces: water resistance</p> <p><u>History</u>: A study of an aspect in British history that extends pupils' chronological knowledge beyond 1066</p>
Support and free materials	2 investigation cards, set of character cards, teacher notes, student work sheets plus free CPD

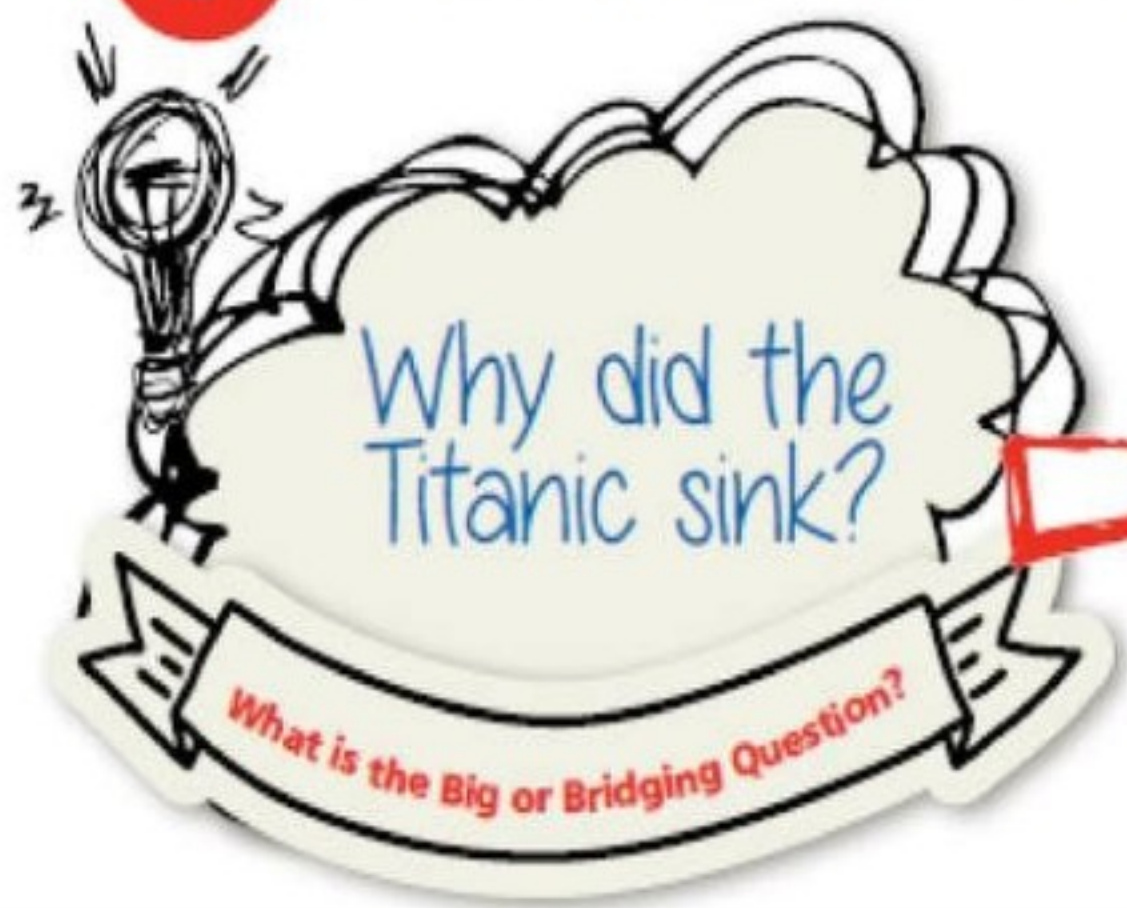
- Bridging question
- Different disciplinary perspectives
- Similarities and differences
- Preferred questions
- Methods
- Norms of thought





5 minute lesson plan

## 1 Building on Current Practice



**Learning Objectives:**

- 1 understand that science and history investigate the question differently (using smaller questions)
- 2 (working scientifically) understand the importance of observation for scientific method

**Before they investigate, what Do they already need to know?**

Building on:

- existing knowledge of scientific process.
- understanding of evidence in history

**Is this building on existing knowledge? Challenging misperceptions? Acting as extension?**

**How does this map on to other areas of the school curriculum?**

- Comparing scientific method with "methods of historical enquiry"
- Devising "historically valid questions"
- Planning different kinds of scientific investigation to answer questions

Ship Iceberg  
 Maiden voyage  
 Film **Unsinkable**  
 10th - 15th April 1912  
 2200 people, 700 survived  
 Southampton to America




5 minute lesson plan

### 2 Developing Epistemic Insight: How can the students be supported to answer these three questions?

How does this discipline interpret the question?

(Sci) How did the Titanic sink?  
(Hist) Who was to blame for the Titanic sinking?


Science & History contrasted in lessons



Helping Hands...  
What expertise/methods/norms of thought can you draw on from other disciplines to support or contrast?


What methods would this discipline use to investigate the question?

(Sci) Predict, Test, Observe, Taking measurements  
(Hist) Investigating different sources



How would (someone in) this discipline know they had a good answer?

(Sci) about Nature of the world, (incl properties of materials & forces)  
(Hist) about people & events in past





**Epistemic Insight**

**Why did the Titanic sink?**

**Essential Experiences in Science**

Were there too many passengers?

How did it manage to sink?

Was the ship too heavy to float?

If the ship was built to be unsinkable?

**Predict, Observe, Record**

Check with an adult that you can use a bowl or the sink for some scientific explorations. Fill with water. Choose a variety of fruit to put in the water.

Which do you predict will float? Which will sink? Why?

Observe what happens to each fruit and record. Were your predictions correct?

Can you make something that floats sink? (e.g. what happens if you poke a hole in it? Can you wrap it in something e.g. an elastic band?)

I went to the fruit bowl in my kitchen and picked out a grape and a watermelon, but I accidentally dropped them into my washing up bowl! To my surprise, the watermelon floated on the water. Even more surprising, the grape sank to the bottom!

Why did the watermelon float when it's so heavy?

And why did the grape sink even though it's so small?

Canterbury Christ Church University

- Science answers the smaller question...  
    **“What caused the Titanic to sink?”**
- The answer focuses on questions about materials, floating and sinking, density – forces and water resistance.
- These types of questions can all be investigated through experiments using observations.







## Can you build an unsinkable ship?

How did the Titanic sink?



Science prefers to ask questions which investigate the nature of the world around us?

**What caused the Titanic to sink?**

Science preferred methods:

**Investigate through observation.**

**Undertake measurement to test hypothesis**

Science norms of thought (what science values):

**A consensus about the results**

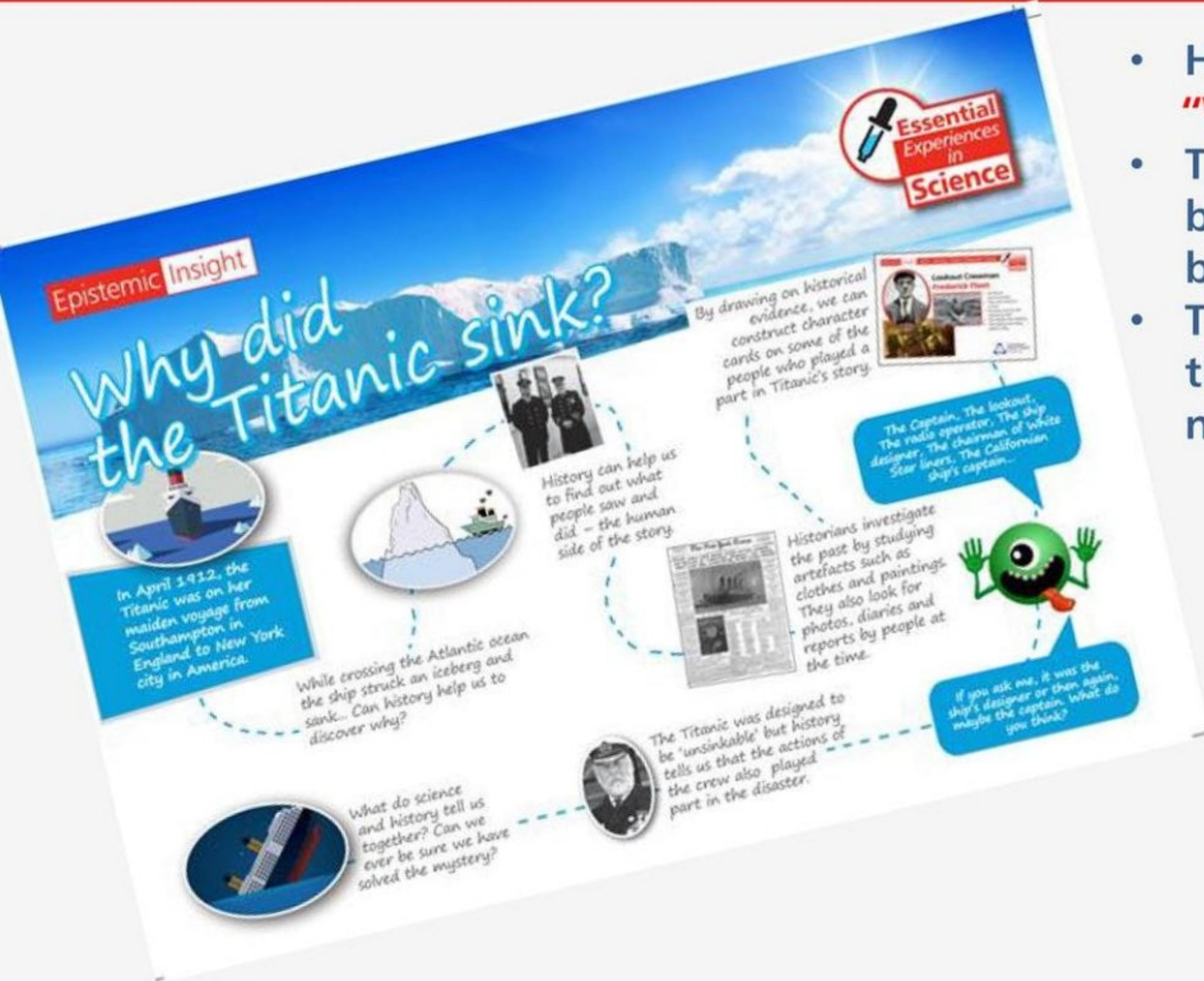
**Results allow accurate predictions**

**Results are objective**

Materials	What is it made of?	
Design	How is it made?	
Predict	What will happen?	
Test	Shall we try it?	
Repeat test	Try it again!	
Observe	What can you see?	
Agree results	What happened....?	



- History answers the smaller question **“Who was to blame for the Titanic sinking?”**
- The answer focuses on the roles of different people on board the Titanic but can also include those who were building the ship.
- These are investigated by looking at a range of sources and thinking about the bias and purpose of diary entries, newspaper reports...







History prefers questions about people and events from the past:  
**Who was to blame for the Titanic sinking of the Titanic?**




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**



Epistemic Insight KS2 - History Titanic Character Cards

**Essential Experiences in Science**



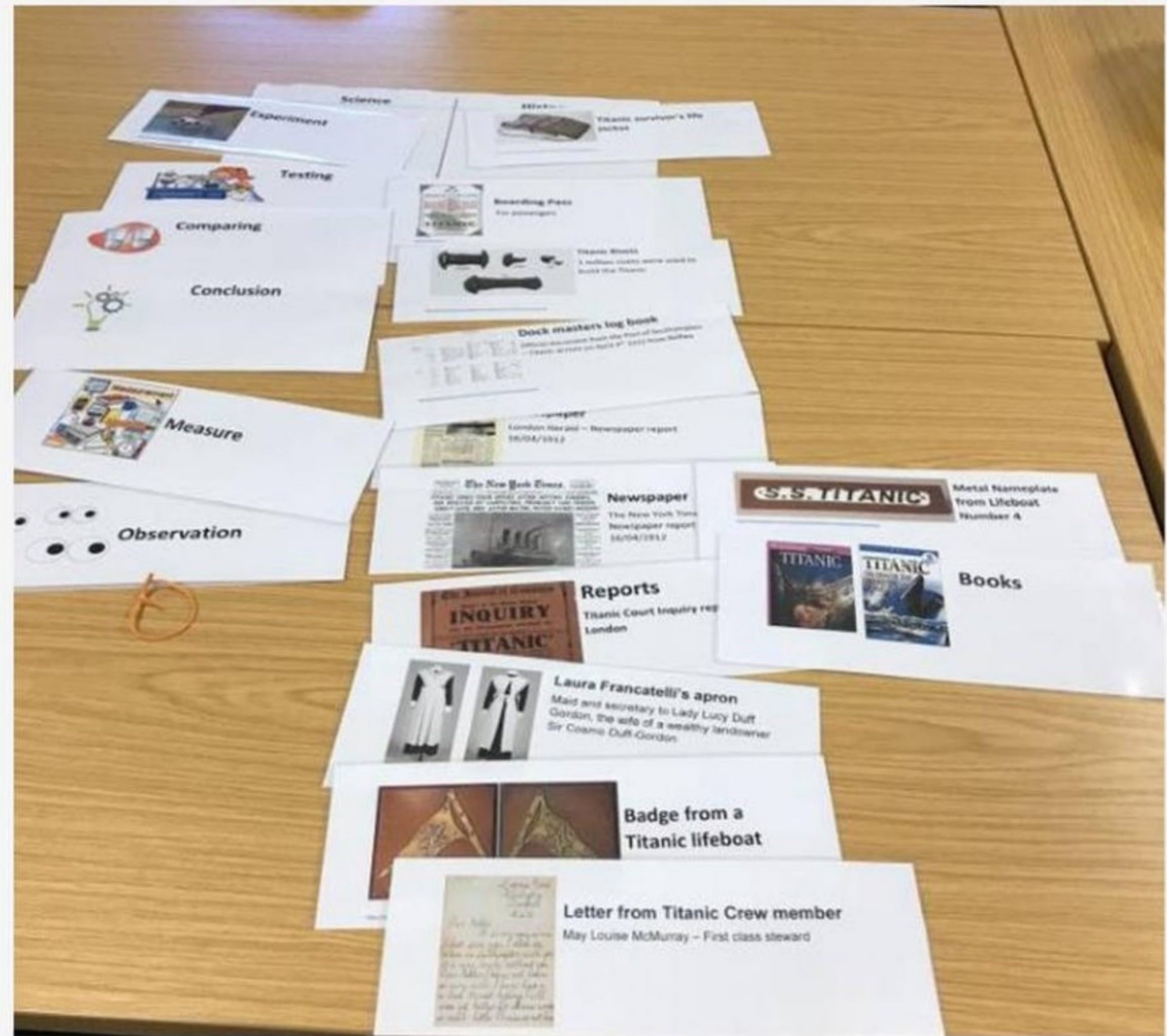
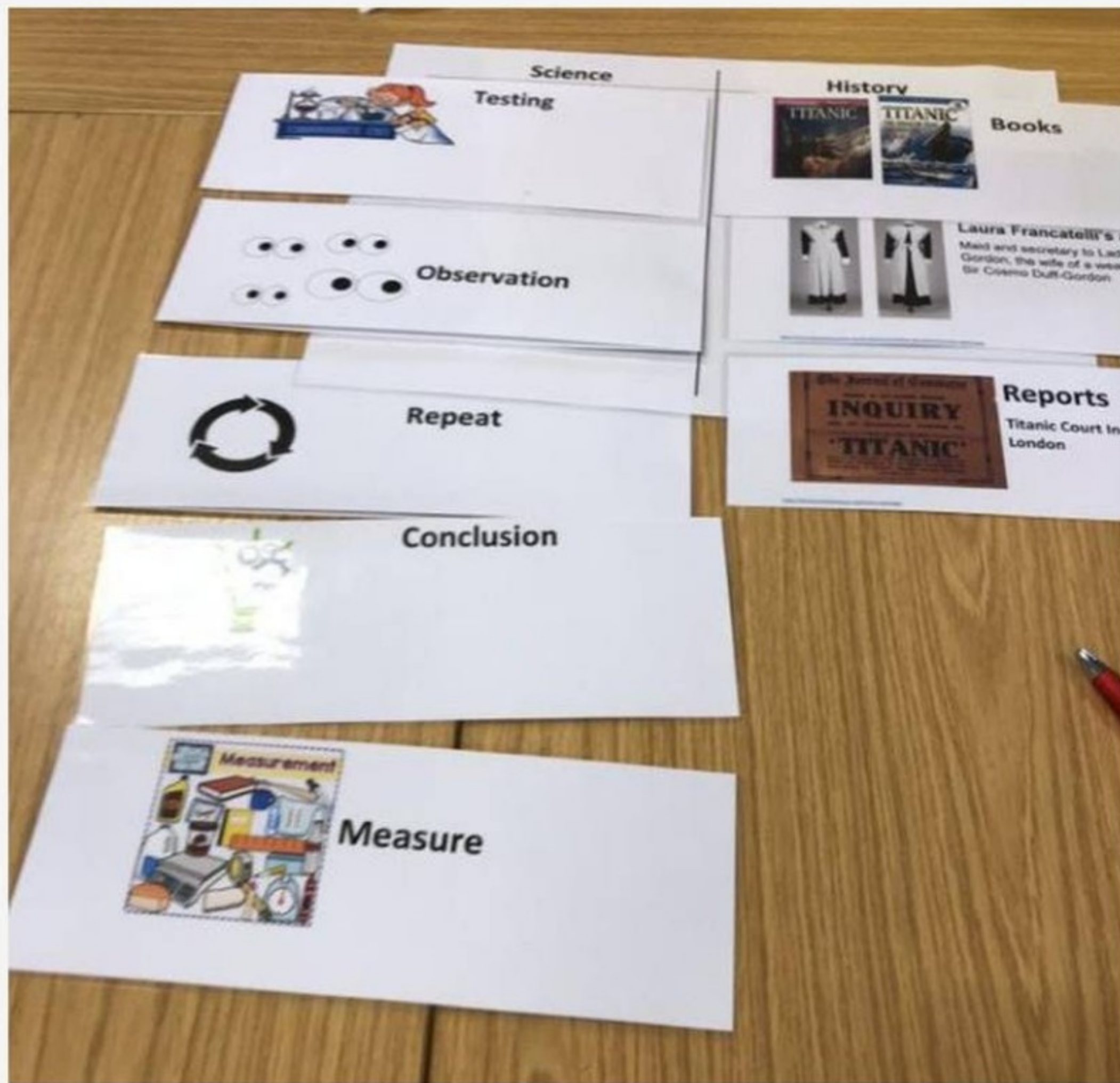
### Captain - The Titanic Edward Smith

- The steamship was sailing fast.
- The weather was icy.
- A coal bunker fire had made the walls hot and out of shape.
- Captain Smith liked to speed.
- He thought the Titanic was unsinkable.

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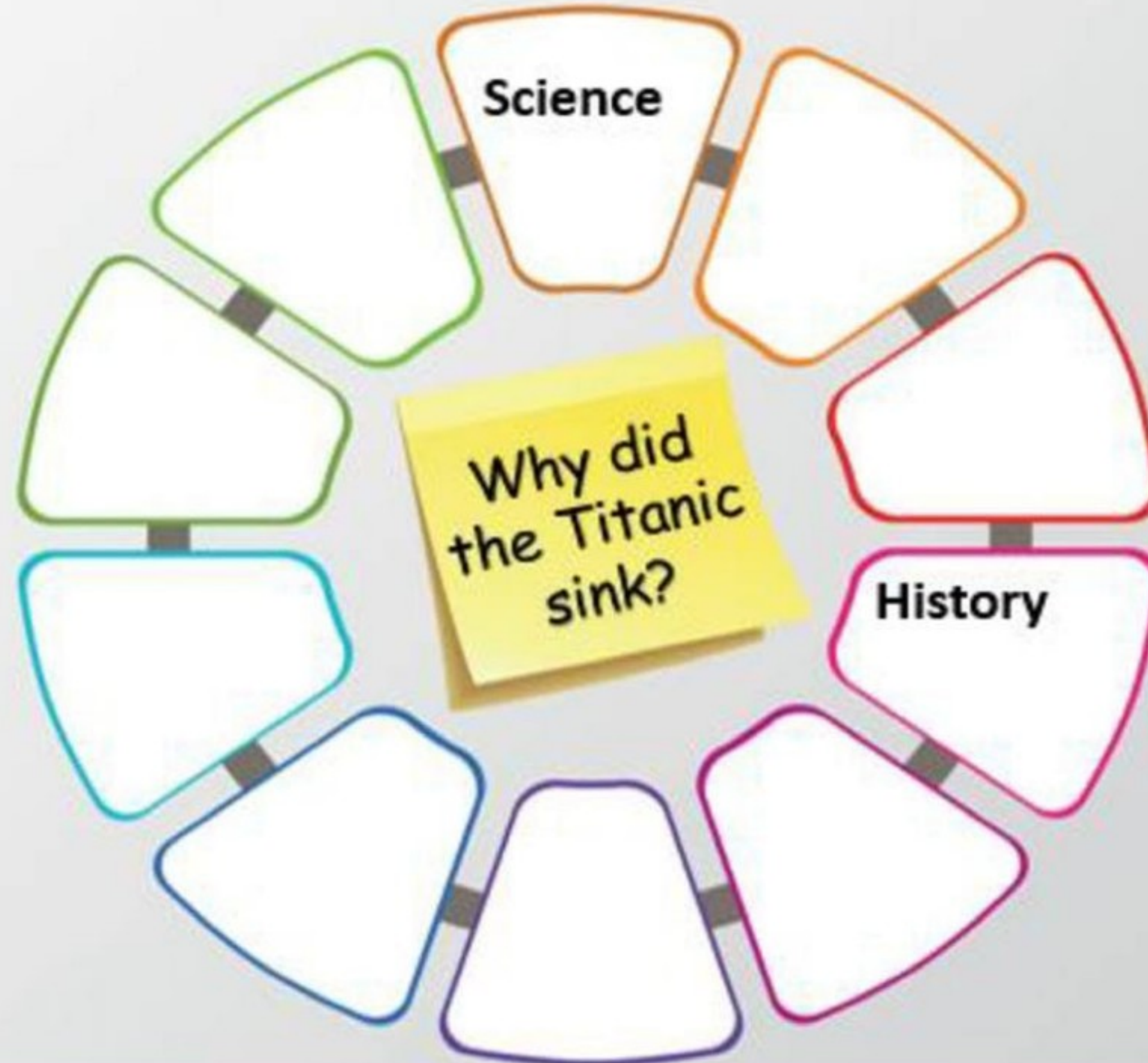






## Science

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



## History

- Collect, organise, interpret
- 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?



5 minute lesson plan

## 3 Building Permeable Classroom Walls: Forming links across the curriculum

What is the misperception/ boundary/ epistemology you are trying to address?

Misperception: that science can fully answer all questions

Addressing "valid" questions look different in different disciplines

Can this be checked in another classroom?

Will be delivered separately across history and science lessons.

Could also be brought in to geography

"WHY" = weather, people & places

Will the session(s) be co-taught? Taught separately across subjects? Draw on knowledge from other subjects

Planned to be delivered in 2 subjects.  
Could also be 1 afternoon lesson.



# How will you respond?



Strongly disagree

My understanding of the disciplines we study in school has improved because of this course

3.8

I understand better how to teach about the similarities and differences between disciplines

4.2

I can explain how science and other disciplines investigate Big Questions

4.2

Strongly agree







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 - and the investigations can be taken home in the event of a local lockdown or quarantine.







**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](mailto: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](mailto: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: Why did the Titanic sink?	<a href="https://tinyurl.com/Why-did-the-Titanic">https://tinyurl.com/Why-did-the-Titanic</a>	9 <sup>th</sup> November
Bridging questions: How do we make sense of music?	<a href="https://tinyurl.com/Make-sense-of-music">https://tinyurl.com/Make-sense-of-music</a>	16 <sup>th</sup> November
Essential Experiences in Science: Why plants matter	<a href="https://tinyurl.com/Why-plants-matter">https://tinyurl.com/Why-plants-matter</a>	23 <sup>rd</sup> November
Bridging questions: Reaching the South Pole	<a href="https://tinyurl.com/Reach-South-Pole">https://tinyurl.com/Reach-South-Pole</a>	30 <sup>th</sup> November
Essential Experiences in Science: Grip or Slip	<a href="https://tinyurl.com/Grip-or-Slip">https://tinyurl.com/Grip-or-Slip</a>	7 <sup>th</sup> December
Bridging questions: What do maps tell us?	<a href="https://tinyurl.com/What-do-maps">https://tinyurl.com/What-do-maps</a>	14 <sup>th</sup> December





## How do we make sense of music?

This session will explore the essential science enquiry of **Can you make music with elastic bands?** Which will be expanded to consider a bridging question which focuses on the disciplines of **science** and **geography** to interpret or investigate the question of how do we make sense of music. It will compare science and geography and consider their similarities and differences to develop students' understanding of science in real-world contexts and multidisciplinary arenas.

- Preferred questions
- Methods
- Norms of thought

