University of Southampton

Remembering Titanic Project

Teacher Workshop 2

15 May 2023

3.00 – 5.30 pm

University of Southampton
(Boldrewood Campus)



James Flood, 2012, *RMS Titanic Arriving at Chelsea Piers*
A fictional scene portraying RMS Titanic arriving at Chelsea Piers in 1912.

REC

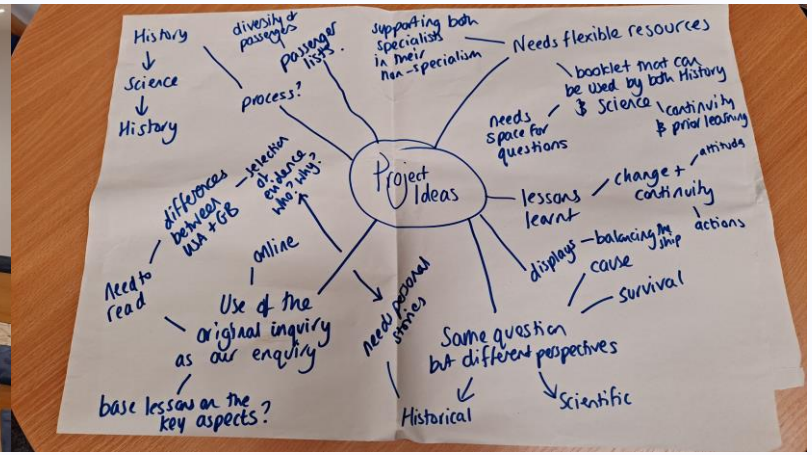
Workshop will be recorded for the project team.
It will not be shared with anyone or publicly.

Workshop 1 recap

1. Strategies to integrate Science & History curriculum goals
2. Strategies to integrate formal & informal learning environments
3. Guided tour of the SeaCity Museum
4. Generating lesson ideas







Plans for today

- Place-based learning and disaster education
- Work as a whole group to develop and discuss a skeletal framework for 6 lessons on Titanic
  - Overarching learning goals
  - Integration of Science & History
  - Integration of formal & informal education
- Plan workflow for designing lesson plans & materials



Recap: Project goals

Develop a short unit of work centered around Titanic

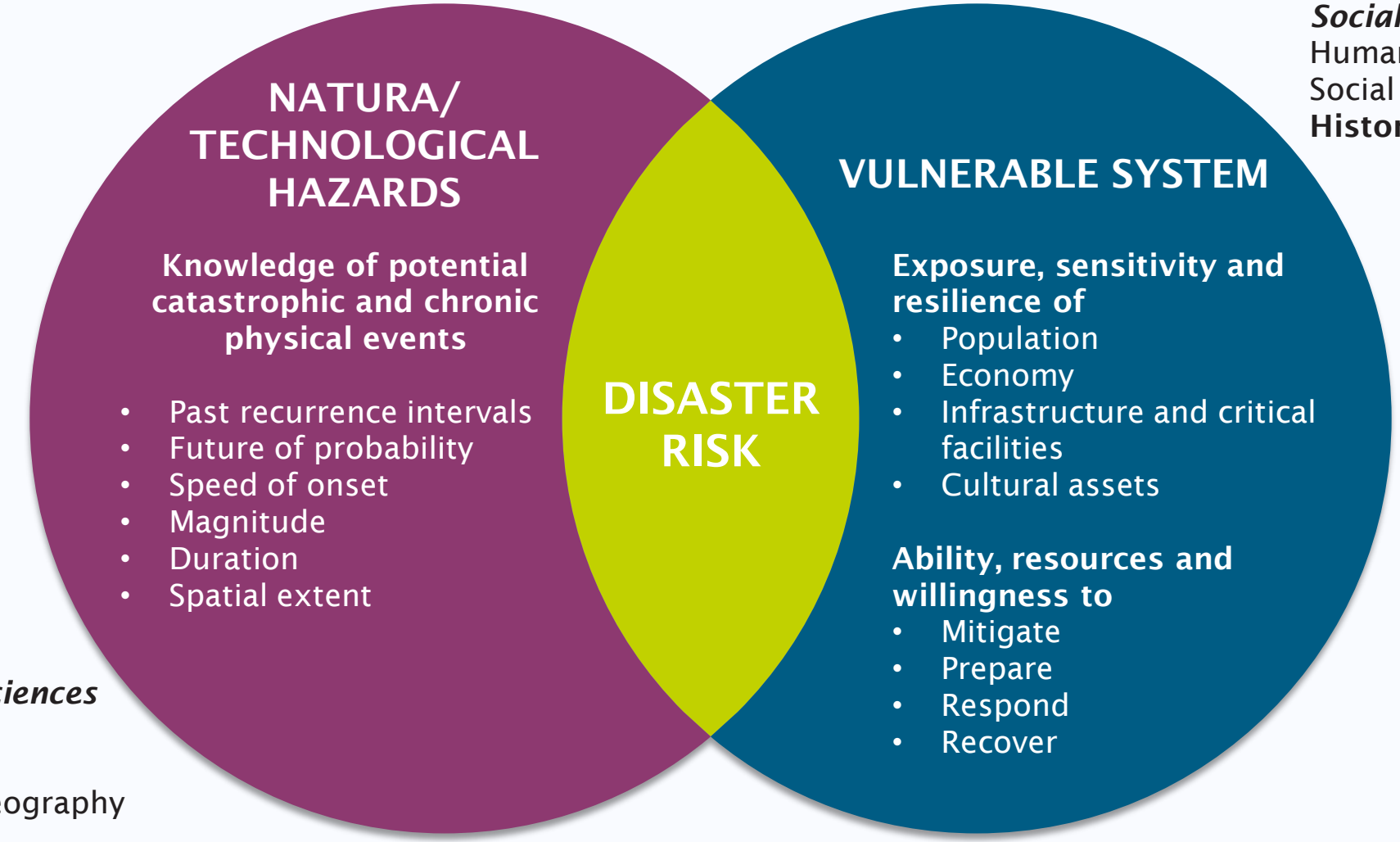
6 lessons- enquiry?	Utilises informal learning opportunities- SeaCity Museum	Meets requirements of aspects of Science + History N/C

What could be the focus of your unit of work? How might the museum content support this?

Which exhibits/resources appeal from both a Science and History point of view?

How might the museum exhibits/resources could be used in your unit of work?

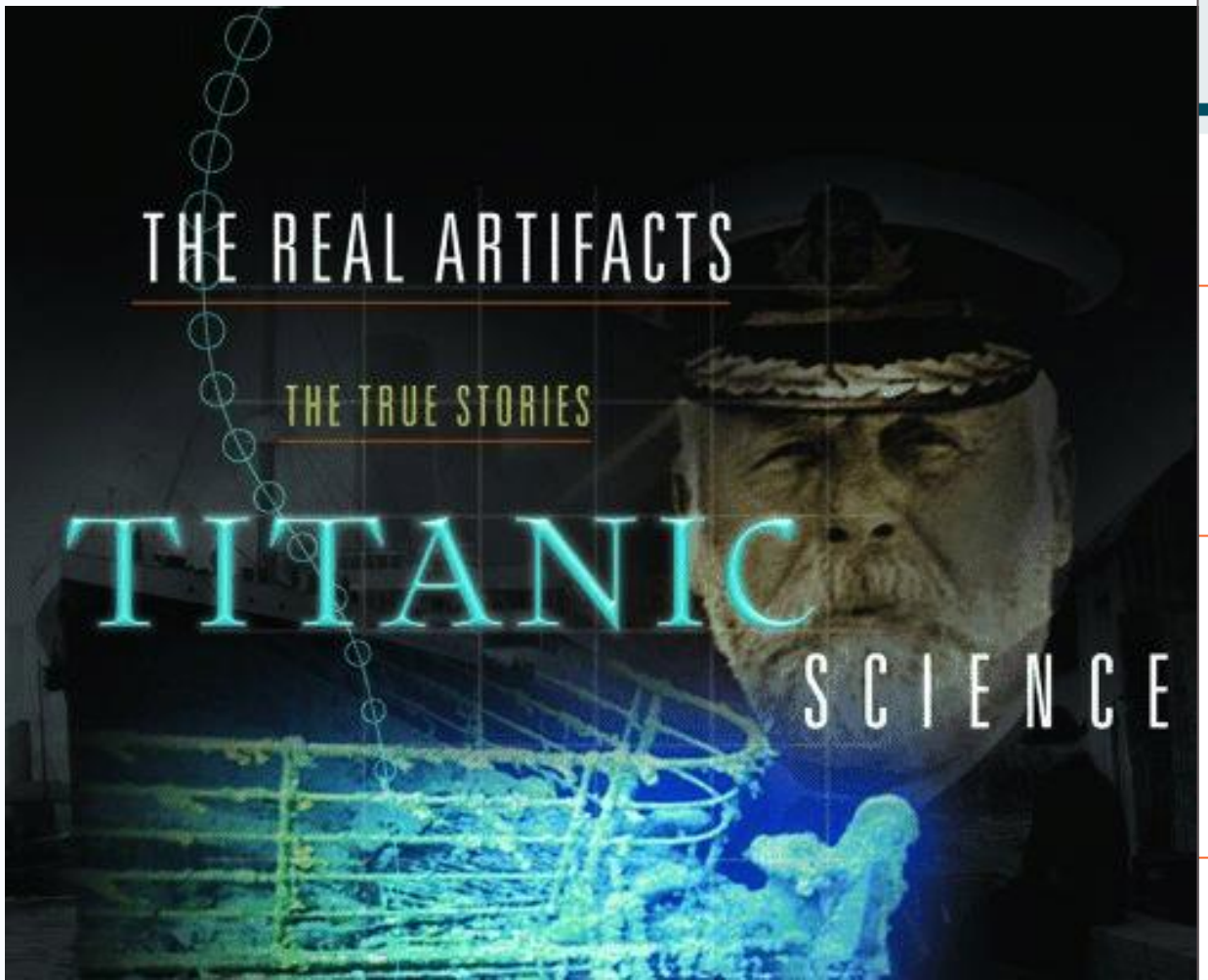
Where disasters arise



Social sciences
Human geography
Social studies
History

Natural sciences
Science
Maths
Physical geography

Teaching Titanic Science



TITANIC SCIENCE

National Educational Standards

Activities	SCIENCE							SOCIAL STUDIES		
	Science as Inquiry	Physical Science	Earth and Space Science	Life Science	Science and Technology	Science in Personal and Social Perspectives	History and Nature of Science		Time, Continuity and Change	People, Places and Environments
The Great Ship										
Sinkers and Floaters	●	●								
Buoyancy	●	●	●							
Displacement	●	●	●							
Design a Ship	●	●	●		●					
Watertight Bulkheads	●	●	●		●					
What Sank the Titanic?										
Making an Iceberg		●	●							
Plotting Icebergs and Locations									●	●
Calculating Iceberg Frequency			●			●			●	●
Water Pressure		●	●							
Rivet Failure	●	●			●		●			
Create Your Own Photomosaic					●					●
Photomosaic of Titanic					●					●
Communication										
What We Have Here is a Failure to Communicate	●				●					
Wireless Radio	●	●								

ACTIVITY

Rivet Failure

The National Science Education Standards

- *Science as Inquiry:* Abilities necessary to do scientific inquiry
- *Science as Inquiry:* Understanding about scientific inquiry
- *Physical Science:* Properties and changes of properties in matter
- *Science and Technology:* Abilities of technological design
- *Science and Technology:* Understandings about science and technology
- *History and Nature of Science:* Science as a human endeavor

Teacher Background:

One of the mysteries surrounding *Titanic* is why the ship sank so quickly. It truly was a well-designed ship, yet a glancing blow from an iceberg sank it. Other ships had struck icebergs head on and survived. So why didn't *Titanic*?

One area of inquiry has focused on the strength of the materials used in *Titanic's* construction. Most of *Titanic's* structure was made of iron in various forms. The plates that formed the ship's hull were made of steel and the rivets that held the plates together were made of wrought iron. Lines of rivets held metal plates together, much like sewing thread holds together two pieces of cloth. Investigations have shown the strength of the steel used in the hull plates to be within normal limits for 1912, but at least some of the rivets were substandard. Dr. Tim Foecke of the National Institute of Standards is conducting an ongoing investigation of the rivets.



Under construction. Notice the horizontal seams where steel plates were riveted together. The impact with the iceberg separated these seams.

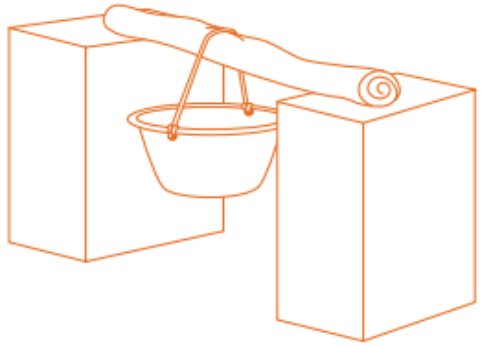
Pure iron is a soft metal. A soft metal will crumple or bend on impact but still hold together, while a brittle one will break apart. The rivets were supposed to be made of wrought iron, which is iron with 1 to 2 percent slag fibers running through it. Slag is a by-product of metalworking and can consist of a variety of substances (silicon, sulfur, phosphorus, aluminum, etc.) depending on its source. Slag gives iron strength but also increases its brittleness. Small amounts of slag (1-2%) make wrought iron, which is strong but not brittle. Modern forensic investigation, led by Dr. Foecke, of rivets taken from the wreck show that the slag content in some of the rivets was very high—between 6 and 10 percent, and the slag was present in large chunks, rather than small fibers. This combination made the rivets brittle and more prone to break under stress—such as hitting an iceberg.

How did such poor quality rivets find their way onto *Titanic*? In 1912, the production of

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2000-2002

http://www.theteachersguide.com/sciencemisc/titanicscienceteachersguide.pdf



Procedure:

Advance preparation (can be done by the teacher or students)

1. Weigh out 10 grams of angel hair pasta and break it into small pieces.
2. Weigh out 75 grams of clay.
3. Mix the pasta pieces into the clay. Knead it until the pasta is thoroughly mixed through the clay.
4. Roll out the clay into thin rods, 5 ml in diameter and 4 inches long.

Note: Working with the amounts listed above will give enough pasta/clay mixture for several rods.

5. Repeat the above steps with the linguini.
6. Allow rods to air dry overnight.

In this experiment, the pasta is taking the part of slag and the clay represents the pure iron. The angel hair rods and the linguini rods have the same weight of pasta mixed into them, but the size of the pasta pieces is different. Ask students to predict which rods will be stronger. Why? (Students may assume that the larger, thicker pieces of linguini will add to the strength of the clay)

7. Take a small plastic cup. Punch two holes on opposite sides. Tie a length of string to both sides to form a basket.
8. Take one of the rods, place it across a gap between piles of books or between two desks. Suspend the basket from the rod.
9. Add weights to the basket until the rod breaks. Record how much weight it took to break the rod.
10. Conduct several tests with angel hair and linguini rods. Average the results. What happened? (On average, the rods with linguini will break under less weight than the rods with the angel hair. The larger linguini pieces create clumpy areas of weakness, much as the larger chunks of slag did in the inferior rivets found in *Titanic*.)

2000-2002

http://www.theteachersguide.com/sciencemisc/titanicscienceteachersguide.pdf

Considerations for teaching about disasters

- **When** did it happen? Titanic (1912) vs Grenfell Tower (2017)
- **Where** did it happen? Titanic (Southampton, UK) vs Hillsborough (Sheffield, UK) vs 9/11 (New York, USA)
  - **Community/Place-based education**
    - Engages students with local cultures, environment and heritage
    - Helps community in solving current problems
    - Develops appreciation for roots and connections
    - Encourages young people to make sustained contribution to local community
- Emotional, ethical, political and controversial aspects of disaster
  - Who's responsible: How much to talk about accountability and responsibility?
- Alignment with existing curriculum goals

Historical significance

- Why is something like Titanic remembered? Why is it taught?
- Key disciplinary concept: Significance. What makes somethings history and others simply 'things that have happened'?
- The significance of a person, place, event in time is connected to the meaning, influence it has. Depending on where you are standing in place or time, the historical significance of something will change.
- The significance of something will change according to the specific historical questions we might be asking, the time period we are in or what we are trying to discover about a time period.

History educators have attempted to create methods or criteria for identifying historical significance to support student judgements about the relative significance of an aspect of history being studied.

- Importance (to people in the past)
- Profundity (how deeply lives have been affected)
- Quantity (how many lives were affected)
- Durability (for how long were lives affected)
- Relevance (to the people of today) (Partington 1980)

Critique: Not chiefly concerned with what pupils might learn about historical significance.



Acronyms

- Groundbreaking
- Remebered by all
- Events that were far reaching
- Affected the future
- Terrifying (Phillips 2002)

Remembered- actively commemorated
Resulting in change- historical consequences
Resonant- events by which people seem to orient themselves
Remarked upon
Revealing – deal with the discipline of history itself. (Counsell, 2011)

- **Critique:** seems to be ascribing intrinsic significance to an event itself (not subject to differing experiences of people across time and place)
- understand why people may hold different ideas about what has been significant;
- understand that the significance of an event is determined by the nature of the historical enquiry.
- Dealing with the workings of a collective cultural memory.

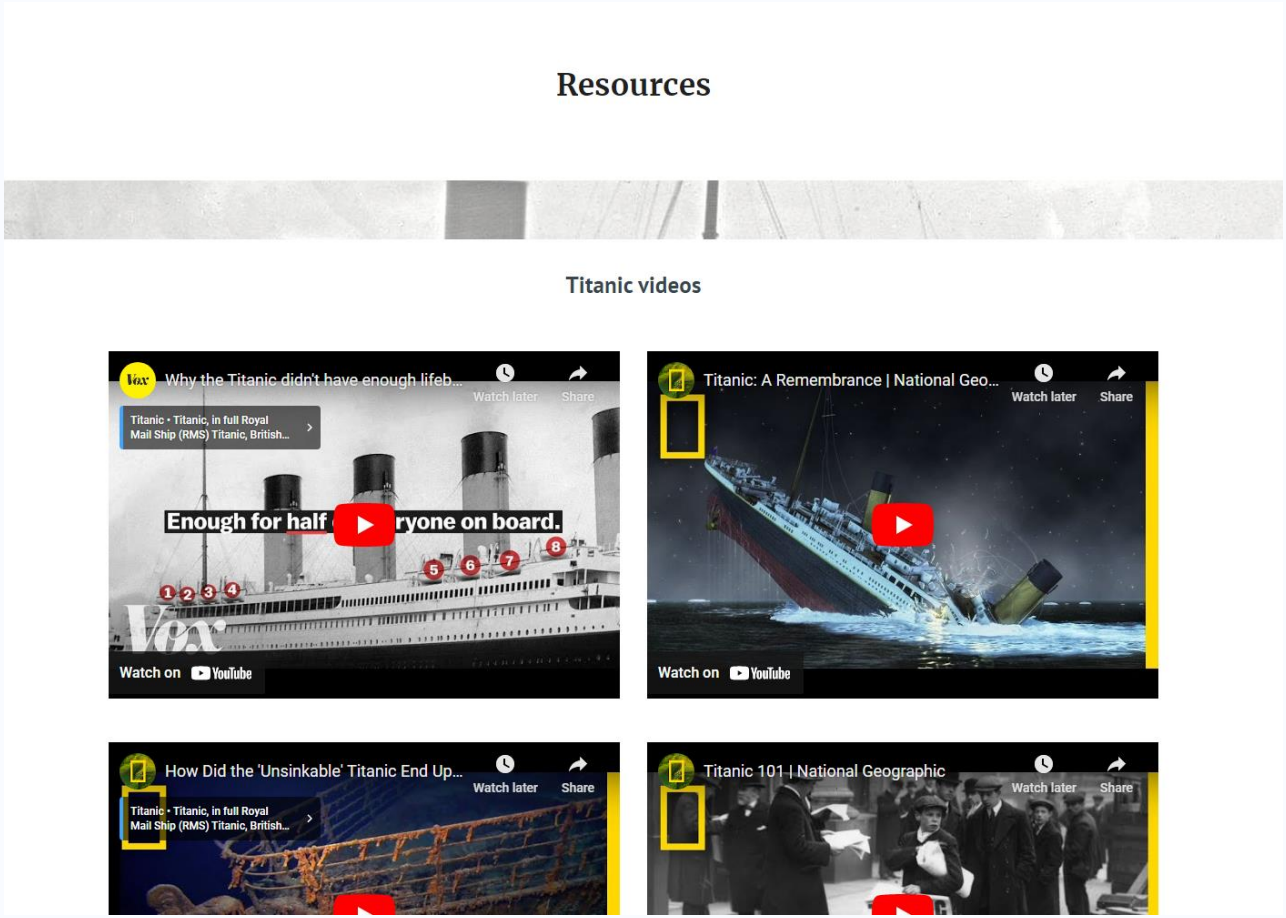
Over to you...

- Construct outline SoW for 6 lessons
- Utilise informal learning opportunities via SeaCity museum
- Meet aspects of science and history national curricula
- Lessons will be fleshed out/resourced at the next workshop.



Existing Titanic resources

- Top Titanic Resources For Teachers And Students (ultimatetitanic.com)
- Remembering the Titanic | National Geographic Society
- Titanic Science - Teacher Guide (USA)
- Titanic Science | Primary Science Teaching Trust (pstt.org.uk)



Next steps

A short feedback form – Your thoughts about today

Third CPD Workshop:

Thursday 29 June 2023, Avenue Campus

We will work on…

- Develop lesson plans and materials
- Reflect on the process

