

Titanic: The Unsinkable Challenge

4-5 Grade STEM Start-Ups



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1. TITANIC - THE UNSINKABLE SHIP

Primary Resources: *Titanic: Magic Tree House Research Guide* by Will Osborne and Mary Pope Osborne

1.1. INTRODUCTION

At 2:20 a.m. on April 15, 1912, the “unsinkable” RMS Titanic disappeared beneath the waves, taking with her 1,500 souls. The wreck slept in the darkness for nearly 72 years, 2 ½ miles beneath the surface on the muddy floor of the North Atlantic. Sadly, if the ship is left untouched underwater, nature will finish the job the iceberg started. But isn’t the shipwreck an educational time capsule of this horrific event, one that should be preserved for generations to learn from and explore? On the hand, should people be allowed to disturb it since it is a tomb and memorial for those who lost their lives?

In this lesson, students will watch, read, annotate, and analyze multiple accounts of the same event, noting important similarities and differences based on the viewpoint the texts represent. Furthermore, students will gather information and evidence from these texts to write a multi-paragraph opinion essay addressing the following prompt: *Should the Titanic artifacts remain underwater for private mourning or are the remains meant for public education?*

Finally, students will have an exciting design challenge in which they will create another steamship, S.S. Olympic. The students will compete against each other to make a boat float and have it carry the most mass without sinking. In order to complete this challenge, students will engage effectively in collaborative discussions with diverse partners and build on others’ ideas and express their own clearly. They will review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

1.2. MATERIALS

- *Magic Tree House Research Guide* by Will Osborne and Mary Pope Osborne (Chapter 10)
- *Save the Titanic* by Robert Ballard - National Geographic April 2 Video Clip
 - (<https://www.youtube.com/watch?v=rGNVPJF2sG0>)
- Titanic at 100: Preserve the wreck or let it go?
 - <http://usatoday30.usatoday.com/tech/science/story/2012-04-04/titanic-science/53982018/1>
- Aluminum foil
- Scotch tape
- Ruler
- Sink, bucket, tub, or dishpan
- Water
- Pennies

1.3. LANGUAGE ARTS WORK

1.3.1. EXPLORE THE TEXT

- Students will read, underline, and annotate the texts to gather evidence in order to form a supportable opinion for the following prompt: *Should the Titanic artifacts stay underwater for private mourning or are the remains meant for public education?*
- Students will fill out the chart (Figure 1) to help form an educated opinion.

Reasons to Leave Artifacts Underwater	Reasons to Bring Artifacts to Surface

Figure 1: Evidence Chart

1.3.2. PART 2

- Students will form an opinion and write a multi-paragraph essay addressing the following prompt: *Should the Titanic artifacts stay underwater for private mourning or are the remains meant for public education?*
 - Essay should include:
 - Purpose, Focus, and Organization
 - Thesis statement (states opinion to the prompt with at least two main ideas)
 - An introduction, 2 body paragraphs, and a conclusion
 - Transitional words/phrases
 - Evidence and Elaboration
 - Relevant evidence used to support main ideas
 - Evidence that references sources used from text
 - Academic and domain-specific vocabulary

- Conventions of standard English
 - Capitalization
 - Spelling
 - Grammar

1.4. DESIGN CHALLENGE

Congratulations! You have been hired as the new chief designer for the White Star Line company in the development of their new luxurious steamship S.S. Olympic, Queen of the Ocean. Your task is to design a boat that will carry the most mass without sinking. The boat has to float, not tip over easily, and cannot be larger than 6x6x6 inches. Once the boat is created and can float, people (pennies) will be added to your boat. The boat that can carry the most mass (pennies) without tipping over or sinking on the water wins the challenge.

1.5. DESIGN PROCESS

In their journal the students will answer the following questions:

- Ask:
 - What is the problem?
 - What are the materials?
 - What are the constraints?
- Brainstorm:
 - What are some ideas?
- Plan:
 - Draw and label a sketch for your solution
- Test
 - Was your challenge successful? Why or why not?
- Improve/Reflection:
 - If you were to do the challenge over, what would you keep the same and what would you do differently? (Justify/Provide evidence for each answer.)

1.6. RUBRIC

Category	Developing (1)	Good (2)	Excellent (3)	Score
Language Arts Work (Purpose, Focus, or Organization)	The opinion essay does not yet have a purpose, focus, or organization.	The opinion essay is on the right track of a purpose, focus, or organization.	The opinion essay has a purpose, focus, or organization.	
Language Arts	Essay does not yet contain	Essay is starting to contain	Essay does contain	

Work (Evidence and Elaboration)	evidence or elaboration.	evidence and elaboration.	evidence and elaboration.	
Language Arts Work (Conventions of standard English)	Essay has many mistakes with the conventions of standard English.	Essay has some mistakes with the conventions of standard English.	Essay has few mistakes with the conventions of standard English.	
Design Process	<p>Brainstorming: Ideas are unclear to connect to problem.</p> <p>Plan/Create/Build: The design and model is not aligned with the criteria, constraints, and intent of the problem.</p> <p>Improve/Reflection: Student only explains one concept either what would be kept the same or what would be changed. Also, does not provide evidence for response.</p>	<p>Brainstorming: Ideas are somewhere aligned to problem but need explanation to make clear.</p> <p>Plan/Create/Build: The design and model is somewhat aligned with the criteria, constraints, and intent of the problem.</p> <p>Improve/Reflection: Student explains what would be kept the same and what would be changed, but does not provide evidence for response.</p>	<p>Brainstorming: Ideas are aligned to problem.</p> <p>Plan/Create/Build: The design and model is aligned with the criteria, constraints, and intent of the problem.</p> <p>Improve/Reflection: Student explains what would be kept the same and what would be changed. Provides evidence for response.</p>	
Collaboration	<p>Ignores and distracts others.</p> <p>Shows no understanding of project and has a negative attitude during work time.</p> <p>Argues with others and does not ask or answer any questions.</p>	<p>Listens respectfully and follows directions.</p> <p>Shows understanding of project and sometimes will argue with others.</p> <p>Asks and answers questions.</p>	<p>Listens respectfully and engages in discussion.</p> <p>Shows understanding of project and has a positive attitude during work time. Never argues with others.</p> <p>Asks and answers questions and provides evidence to support answers.</p>	

1.7. RESOURCES

These are two nonfiction materials for students to analyze and form an opinion for their prompt: Should the Titanic artifacts stay underwater for private mourning or are the remains meant for public education?

- Save the Titanic by Robert Ballard - National Geographic April 2 (Video Clip)
<https://www.youtube.com/watch?v=rGNVPJF2sG0>
- Titanic at 100: Preserve the wreck or let it go? (Nonfiction text and video clip)
<http://usatoday30.usatoday.com/tech/science/story/2012-04-04/titanic-science/53982018/1>

This 5 Step Engineering Design Process template can help the students answer the questions for the design process during their challenge.

- The Works: The Hands On Museum - <http://teachers.egfi-k12.org/wp-content/uploads/2010/05/Post-lesson-Student-Activities-Engineers-and-the-Engineering-Design-Process.pdf>