

# Before we begin:

- We want to know who is here! Please introduce yourself in the chat: Name. School.
- Please mute your microphone to reduce background noise.
- We will leave time for Q & A. **Please submit your questions via the Google form that will be shared in the chat.**
- This presentation, along with the questions and answers, will be posted on the WESO website.



# Barge Building

WESO 2024

**Event Supervisors:**  
Sarah Gelsanliter

# Official Rules



- At the tournament, the event will be executed according to the **published FINAL** Event Description and subsequent clarifications **posted** on the Blog.
- If comments made during this presentation contradict that which is found in the event description or blog posts, please contact us at [\*\*weso.events@gmail.com\*\*](mailto:weso.events@gmail.com)
- The written Event Description will be updated, if needed, with clarifications arising from this presentation.

# Goals for this event:

01

## PHYSICS

Learn about Archimedes Principle, density, volume, buoyancy and barge construction techniques.

03

## ESTIMATION

Estimate weights and number of objects.

02

## TEAMWORK/ FUN

Encourage positive interactions and good sportsmanship!

# Event Basics

- GRADES: 2 and 3
- TEAM SIZE: 1-2 participants/grade
- DURATION: 30 minutes

The detailed event description can be found at: <https://wesoscience.org/events/>

# EVENT FORMAT

## Overview

- Barge Construction
- Written Prediction of Cargo held
- Barge Loading
- Scoring & Tie-breaking Criteria

# EVENT FORMAT

## Barge Construction

- Reynolds Wrap Heavy Duty Aluminum Foil will be used to construct a barge.

2nd grade : Foil is 15cm x 15 cm.

3rd grade: Foil size is unknown in advance.

- 10 Minutes will be given to build.
- If a team damages their foil, they may trade in for a new piece, however no additional time is granted. They may do this 3 times.



# EVENT FORMAT

## Written Prediction

- Students will be told what the cargo is and given a sample piece with their foil.
- Prior to the end of the 10 minute build time, they must make a written prediction of how much cargo THEIR barge will hold.
  - If nothing is written, their prediction is ZERO.
- School name must be written on this prediction sheet.
- In case an additional tie break is needed, students will also be asked to estimate how much cargo a mystery object can hold.







# EVENT FORMAT

## Cargo Loading

- Students will place barge in basin of water.
- Students will be given dry cargo to load. Cargo must be loaded one piece at a time.
- Students have 5 minutes to load as much cargo as their barge will hold. The barge must be loaded until it sinks.
- Sinking is defined as the entire barge submerging, cargo falling off the barge into the water, or water otherwise entering the barge.
  - This included waves that wash over the edge of the barge from the table being bumped by students.

# EVENT SCORING

Teams are ranked from highest to lowest score.

$$\text{Score} = (\text{cargo loaded}) * 10 - |(\text{predicted cargo}) - (\text{actual cargo loaded})|$$

Actual cargo loaded is defined as the number of pieces of cargo loaded to the barge minus 1 (the piece that caused it to sink).

Teams will be disqualified if they intentionally sink their barge at or near the predicted cargo. Score will be maximized by maximizing the cargo loaded.

# Event Scoring - Tie Breakers

- **1st Tie Break Criteria:** Accuracy of prediction. The team whose prediction is closest to actual load wins tie break.
- **2nd Tie Break Criteria:** Exceeding Expectations. In the event the 1st tie breaker does not resolve a tie, the team whose prediction did not exceed actual cargo is the winner.
- **3rd Tie Break Criteria:** Estimate of Cargo to sink mystery item.

# SCORING Example

- Team A predicted 45 pieces of Cargo. The barge held 50 pieces. Their score is  $50*10 - |45-50| = 500 - 5 = 495$ .
- Team B predicted 55 pieces of Cargo, their barge held 50 pieces. Their score is  $50*10 - |55-50| = 500 - 5 = 495$ .

Team A wins the tie, based on Tie Breaker #2.

Medals will be awarded to top 8 teams per grade.

# COACHING ADVICE

- Allow the kids to experiment with barge sizes and shapes:

Do high walls matter more or less than bottom area?

Is there an optimum bottom area/volume of barge?

- Practice building the foil barge and sealing to water
- Practice loading carefully, but within 5 minutes of time. Dropping cargo into barge may make waves.
- Practice with different cargo weights and estimating how much a barge can support.
- Make sure they support each other.
- Most importantly, make it fun!

# Questions after tonight?

Please submit questions about this event to [weso.events@gmail.com](mailto:weso.events@gmail.com). Enter the event title in the subject line. Answers will be posted on the WESO Blog. You can sign up to receive the blog posts at [wesoscience.org](http://wesoscience.org).

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# QUESTIONS NOW?



- Please submit your questions now using the Google form that was shared with you in the chat.
- We will answer live and post all questions and written answers to the website following the meeting.

Thank you for serving as an event coach and helping us bring back WESO to our community!