FEBRUARY 15-APRIL 30

5TH ANNUAL RECYCLE REGATTA

RULES & GUIDELINES

The Recycle Regatta is a free, fun, hands-on competition for K-12 students to participate in from anywhere! Students build a model sailboat from recycled and repurposed materials and race to victory while discovering engineering, mathematics, sailing, buoyancy, and stewardship.

COMPETITION GUIDELINES

1. Engineers always plan before starting to build! Start by making a blueprint; this can be a drawing, list of materials, or a write-up of what you plan to do. Sailboat submissions should be small-scale (less than 40 cm long) and uncrewed.

2. Gather materials (safely!) that are recycled or discarded. We do not encourage buying new materials.

3. Set up your testing bin, boats should fit inside your testing bin and have at least 25 cm on each side to move. If it is too large, it will be difficult to calculate speed.

4. Build a prototype, students may end up changing their design before testing.

5. Time to test! See how the boats move, float, and sail. Do they stay upright? Do they float? If not, update the designs until you have the perfect vessels!

6. Test and document speeds for at least 3 trials on the data form. To test speed, place a boat in testing bin with water and markers for a distance (try 1 foot with a ruler). Then create "wind" using your breath and blowing on your boat, blow using a reusable straw, or use a fan (NOTE: adult supervision is required to use a fan - use the lowest power setting and keep electrical parts at a safe distance AWAY from the water).

   Document how much time it takes to travel that distance. Submit your best 3 trials on the entry form. Use the formula Speed = Distance/Time to calculate speed. All speed calculations should be done in cm/second. Document the results.

7. Improve your design based on the testing process and start the testing process again! Can you make your boat go faster by changing the design?

8. Submit your entry form by APRIL 30 online at recycleregatta.info.

BUILDING RULES

We encourage you to be a steward of the environment in addition to an honorable mariner. Your boat must be built from recycled or discarded materials- i.e. objects that have already been used at least once. The Recycle Regatta team strongly discourages participants to buy new materials for this project. Design is left to engineers! Let your imagination take over. These lists are not all inclusive! Our goal is to convert and repurpose waste to create fantastic boats!

ACCEPTABLE MATERIALS:

- ☐ Plastic
- ☐ Cans - aluminum, tin, any that will float
- ☐ Duct tape
- ☐ Cardboard
- ☐ Glue
- ☐ Fishing line
- ☐ Other recyclable/discarded items with positive buoyancy (they float)!
- ☐ Decorations and crew costumes are allowed and encouraged!

PROHIBITED MATERIALS:

- ☐ Wood
- ☐ Rubber
- ☐ Inflatables - raft, pool toys, etc.
- ☐ Fiberglass
- ☐ Caulking compounds
- ☐ Electrical systems
- ☐ Engines - gasoline powered, battery powered, etc.
- ☐ Paint or varnish (can be used for decoration, but not for waterproofing)
- ☐ Raw materials made out of recycled content (Trex decking, etc).

SAFETY RULES

Please read the following carefully. Failure to comply will result in disqualification.

1. All participating mariners must wear a personal floatation device (PFD) in the water, near the water, or on a dock. If you are testing a boat in a controlled location (such as a bathtub or bin), a PFD is not required, but an adult should be present.

2. Animals cannot occupy a boat.

3. Sunken or discarded boats must be recycled if possible.

4. You must have a means of recovering your vessel after launch, from the surface of the water, or, if your vessel sinks, from Davy Jones' Locker.

5. If you're using a fan as your power source, students MUST have adult supervision to set up and monitor the safety procedures. Electrical parts must be at a safe distance from the water, and only be used at its lowest setting.

6. Most importantly, HAVE FUN! Participants are expected to maintain the decorum and dignity expected of a yachtsperson. Inappropriate behavior at the discretion of the Recycle Regatta team will not be permitted and will disqualify your entry.

SPEED CALCULATIONS

1. Measure and record a specific distance that you know your boat is able to travel. Mark this distance (ex. tape on the side of the tub as a start/finish line). Measure this distance with a ruler, meter stick, tape measure, or other device.

2. Time how long it takes your boat to travel that entire distance!

3. Speed = distance/time. So, if your boat traveled 10 centimeters in 2 seconds, you would set up your equation as 10 centimeters/2 seconds. Your final speed would be 5cm/second. This answer came from dividing 10/2 and combining the units used. Check out the Recycle Regatta website for extra help with speed calculations!

4. Calculate your speed for 3 trials.

5. Find the average distance, time, and speed! We use averages to summarize a group of data or measurements.
    a. Mean average= total sum of the three trials divided by 3
    b. Let's look at an example of finding our average distance in cm.
        i. Add together the 3 distances that were measured: 3cm + 7cm + 6cm = 16cm
        ii. Then take that total, and divide it by the number of trials: 16cm/3 trials=5.333cm
        iii. Here you have your average distance, 5.333cm!

CHALLENGE YOURSELF!

Convert from speed in cm/second to Knots!

Sailors and mariners use a special type of unit to talk about speed. These units are called knots! They take into account nautical miles, which are used in distance measurements out at sea. We've given you the conversion formula for knots, if you want to see how your boat would compare to a life size sailing vessel!

Knots are Nautical miles per hour

1. Take your speed in cm/second and divide it by 51.4444
    a. 5.333cm/s (speed) ÷ 51.4444 = 0.1036 knots

2. The speed in knots might seem small, but remember, you are calculating your speed in nautical miles/hour!

Questions?

Full rules, guidelines, classroom resources, and official entry forms, can be found at RecycleRegatta.info or email: info@educationalpassages.org

RECYCLE REGATTA INCORPORATES CURRICULUM STANDARDS

NEXT GENERATION SCIENCE STANDARDS (NGSS)

Grades K-2: K-PS2-2, K-ESS3-3, 2-PS1-2, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3

Grades 3-5: 5-ESS3-1, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3

Grades 6-8: MS-ESS3-3, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

Grades 9-12: HS-ESS3-4, HS-ETS1-2

OCEAN LITERACY PRINCIPLES (OLP)

Principle 6: The ocean and humans are inextricably linked.

Grades K-2: 6.A.1, 6.A.5, 6.C.3, 6.C.5, 6.C.6

Grades 3-5: 6.A.6, 6.B.1, 6.C.1, 6.C.3, 6.C.7, 6.C.8, 6.C.11

Grades 6-8: 6.A.10, 6.B.2, 6.D.20, 6.D.21, 6.E.7, 6.E.12

Grades 9-12: 6.D.11, 6.E.6, 6.E.9, 6.E.14

CASEL SOCIAL-EMOTIONAL LEARNING (CASEL)

Relationship Skills, Self-Awareness, & Social Awareness:

- Learning how to communicate effectively, resolving conflicts, and showing leadership when working together in teams

Responsible Decision-Making:

- Recognizing how critical thinking skills are useful both inside and outside of school
- Reflecting on one's role to promote personal, family, and community well-being
- Evaluating personal, interpersonal, community, and institutional impacts

Self-Management:

- Setting personal and collective goals
- Using planning and organizational skills

RECYCLE REGATTA STUDENT DATA FORM

ENGINEER NAME(S):

FLEET (Check One): ☐ MINIBOAT (Grades K-2) ☐ OPTI (Grades 3-5) ☐ HARTLEY (Grades 6-8) ☐ LASER (Grades 9-12)

VESSEL NAME:

SKETCH YOUR DESIGN:

BRIEF LIST OF RECYCLABLE MATERIALS USED:

DATA ENTRY:

	TRIAL 1	TRIAL 2	TRIAL 3	AVERAGE
DISTANCE (cm)				
TIME (s)				
SPEED (cm/s)				
SPEED IN KNOTS (nm/hr)				

CHALLENGES OVERCAME TO SUCCEED:

This is not an official entry form. To submit your entry into the 2024 Recycle Regatta, visit RecycleRegatta.info.

5th Annual Recycle Regatta | February 15 - April 30, 2024

Hosted by: New England Science & Sailing (NESS), Educational Passages, and North American Marine Environment Protection Association (NAMEPA)