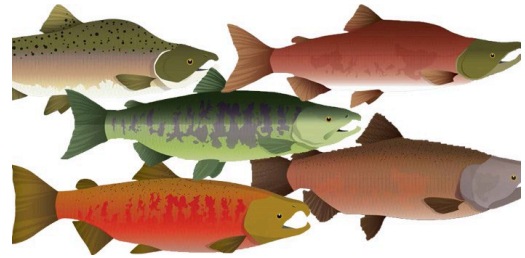


# Physics 12 Honourable Salmon Harvest Project

Name \_\_\_\_\_

*Inspired by the 2017 Kwantlen Science Challenge Washer Collection Event*

**Purpose:** Build an elastic powered boat that collects exactly 12 “salmon” (represented by bottle corks) from an aquarium tank while respecting “honourable harvest”



## Honourable harvest:

In BC salmon are a valuable and important resource to both humans and the broader ecosystem. We want to harvest salmon and be mindful not to take too many, otherwise they will be overfished! We also want to be aware of bycatch. These are fish and other species that are important to the ecosystem but inadvertently caught in the salmon harvest process.

“The Honourable harvest governs our taking, shapes our relationships with the natural world, and reins in our tendency to consume.” (Kimmerer, R.(2022) The Honorable Harvest. Braiding Sweetgrass.154.)

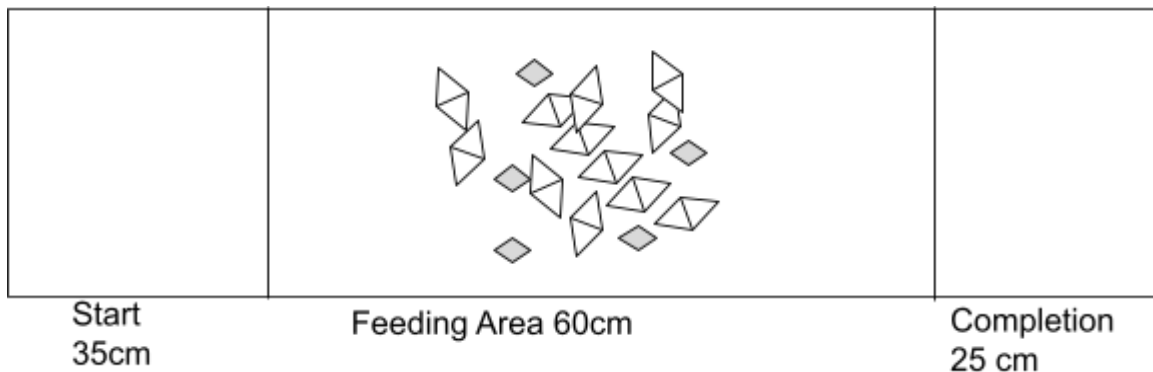
## Guidelines:

- 1) The Aquarium tank is 120 cm long x 30 cm wide x 40cm tall. The water will have a depth of 25cm.
- 2) All boats must fit within the tank, cannot have a length longer than 30 cm, and must not touch the bottom of the tank at any point. (they must float)
- 3) The boats cannot use the glass sides of the aquarium in any way. They are however allowed to touch the glass sides during movement.
- 4) All boats may only draw energy from at most 10.0 separate standard rubber bands.
  - a) Rubber bands may vary in size but no single band may exceed 30cm in standard unstretched circumference and/or 1.0cm in unstretched width.
- 5) The tank will be split into roughly three zones.

The starting area: where the boat is placed and launched.

The salmon feeding area: There will be 24 “Salmon” and 12 “Mackerel” in the “salmon feeding area”

The completion area: Where the boat and successfully caught salmon will be counted and scored.



- 6) The 24 salmon will be represented by sparkling sparkling wine corks. They are approximately 4.5cm in length and 3cm in width.
- 7) The 12 mackerel will be represented by smaller test tube corks. They are approximately 2cm in length and 1cm in width.
- 8) Mr. Chow reserves the right to change any and all rules at any time.



### Scoring:

Teams score based on the following formula:

$$\left( \frac{(\text{Salmon caught} - \text{overfished salmon})}{2} - \frac{\text{Mackerel Caught}}{2} \right) \times \text{zone}$$

Salmon caught (legally) = the number of salmon that are either in or on top of the boat (yes the salmon can and will be wet) The salmon are only considered caught if they have no ability to ‘swim’ horizontally along the surface of the water (parallel to the plane of the water-air boundary) or through the water to escape the boat. There is a maximum of 12 for this value. (vessels caught overfishing will be “taxed”)

\*note\* the glass sides of the aquarium tank may not be used to “trap” the salmon.

Overfished salmon = the number of caught salmon over the limit of twelve (12)

Mackerel Caught = The number of mackerel “caught” in or on the boat

Zone = either one (1) for the boat staying in the start/feeding zone or two (2) for the boat reaching the completion zone with the caught salmon. (if you catch no salmon, we’ll consider this zero)

In the event two or more teams score the same amount, they will be in a tie for that score. There will be no bonus marks for tomfoolery.

### A note about materials:

- A) Rubber bands: as mentioned above. Rubber bands may vary in size but no single band may exceed 30 cm in standard unstretched circumference and/or 1.0cm in unstretched width.
- B) The boat may be assembled out of any common household materials. If there are certain materials already available in the superlab / school, please ask well ahead of time if you can use them.
- C) It is legitimate to buy components from a hobby or toy store. It is acceptable to modify a ready-made toy for this challenge.
- D) The use however of a pre-assembled project or a kit is not allowed. The judge (me) reserves the right to veto any design that they deem counter to the spirit of the rules.
- E) Check in advance if you are unsure.