

EVENT 5: WIND POWER LIFTER

(Revised 11/21/21)

OBJECTIVE: To lift a 375-gram load through a vertical distance of approximately one meter in the minimum amount of time.

RULES:

- a. The wind power lifter must be designed and constructed entirely by the entrants using only straws, hot glue, string and paper cups.
- b. The lifter is to be constructed of plastic or paper drinking straws with a diameter of 0.635 cm (0.25 inches)
- c. Not more than three (3) straws may be placed inside each other,
- d. White hot glue sticks that dry whitish clear or semi-transparent may only be used to join the allowed materials together.
- e. Coating the straws, cups or string with glue with the sole purpose of increasing their strength is not permitted. Additionally, no other material may be used to coat the straws, cups or string.
- f. Not more than four straws may touch one another at a time in a parallel arrangement.
- g. Not more than three (3) straws may be placed inside each other.
- h. The straws and cups may be cut.
- i. The wind power lifter must be free standing: no part of the structure may be attached to any surface.
- j. The lifting mechanism must be able to accommodate a load of at least 375 grams in the form of 3 rolls of 50 pennies each. Pennies dated after 1982 with a mass of 2.50 grams are to be used.
- k. The lifting mechanism will consist of a cup attached to the wind power lifter by any type of string.
- l. The load will be lifted from the floor.
- m. The vanes of the lifter (also called sails or blades) may be constructed from paper cups.
- n. Power is limited to the movement of air produced by a non-commercial household hand held hair dryer of maximum 2,000 watts. Hairdryer is to be supplied by the team.
- o. The hairdryer may **not** be modified in any way.
- p. The most forward prominence of the wind power lifter will be placed a minimum of one foot from the hairdryer.
- q. The team may place the hairdryer farther away, and/or change the speed of the hairdryer, and/or the orientation of the hairdryer during the operation of the wind power lifter.

COMPETITION AND SCORING:

- a. The competition area may either be an all-purpose room cafeteria or a typical high school classroom containing tables or desks.
- b. The wind powered lifter will be placed between two desk or tables
- c. The team will have 5 minutes to assemble their tower.
- d. The size of the wind power lifter must be equal to or less than one cubic meter.
- e. The wind power lifter must be able to span a 10-inch opening through which the line or lifting mechanism must pass to lift the weight. In other words, the device will be mounted spanning two tables with the mass beginning on the floor.

- f. The team will place three rolls of pennies, as described above, into the lifting mechanism of their device. The team is responsible to provide their own pennies.
- g. The load must be lifted to the required height within five (5) minutes.
- h. If the load lifts off the ground but does not rise to the required height, then the maximum time of five-minutes will be used to calculate the score.
- i. In the case of a tie, the lifter will be required to lift additional pennies. It is the team's responsibility to ensure that their lifter can accommodate additional pennies.

SCORE = $\frac{\text{(Your height lifted in cm/your time in seconds)}}{\text{(Winning height lifted in cm/winning time in seconds)}} \times 100$ points

DISQUALIFICATION SCORE = Ten points less than the lowest score for a qualifying wind power lifter but not less than zero. A qualifying wind power lifter meets the rules but does not lift the weight because it cannot generate enough lifting power from the fan.

Testing procedures & scoring may need to be modified if the Olympics is held virtually.

Updates to the rules and Forum discussion / questions with answers are available by going to the NJAAPT website: njaapt.wildapricot.org (top menu, "Events" and "Forum"). It is the team's responsibility to periodically check in or inquire about changes and clarifications to the rules.