

JUNK BOX WARS

Whirling Wonders

Create a wheel powered by water that will pull the greatest amount string.

Competition Rules:

Each team will be provided with a junk box filled with materials that could be used to create a whirling wonder. Each team will receive only one set of materials. Teams may use all or part of the materials in their junk box and are not allowed to share materials with other teams. All unused materials should be saved in case repairs are needed during competition.

Teams will be allowed time to build and test their whirling wonder. Competitors are allowed to bring diagrams to help them build their machines. After the time is up, all machines will be impounded and no changes will be allowed.

Machine Requirements:

Your machine must be powered by the water in the bottle and may not be aided by a helping hand or other energy source. The axle must be anchored to the testing tub and may not move along the top of the box.

Testing Procedure:

Each team will be allowed 5 minutes to anchor their machines, attach the string, and fill the water bottle. Teams will also be allowed 5 minutes between trials to make repairs and adjustments using materials left over from construction. No new construction or major design changes are allowed.

Each team will be allowed three trials. The machine that pulls the greatest length of string (best out of two trials) will be considered for final results. In case of a tie, the lightest whirling wonder will be declared the winner.

Junk Box Possible Supplies

Dowel rods
CDs
Pencils
Straws
Spools
Film Canisters
Rubber Bands
Masking Tape
Yogurt Cups
Glue
Index Cards
Paper
Pipe Cleaners
Wooden Craft Sticks
Clothes pins

Event Score Sheets



Whirling Wonder

Team Name: _____

Team Members : _____

Trial 1:
Total Length = _____

Trial 2:
Total Length = _____

Trial 3:
Total Length = _____

Tie Breaker:
Mass of Whirling Wonder = _____



Whirling Wonder

Team Name: _____

Team Members : _____

Trial 1:
Total Length = _____

Trial 2:
Total Length = _____

Trial 3:
Total Length = _____

Tie Breaker:
Mass of Whirling Wonder = _____



Whirling Wonder

Team Name: _____

Team Members : _____

Trial 1:
Total Length = _____

Trial 2:
Total Length = _____

Trial 3:
Total Length = _____

Tie Breaker:
Mass of Whirling Wonder = _____



Whirling Wonders Teacher Notes

Recommended Supply List:

- 2' Dowel rod (may be cut into smaller sections)
- 6 CDs
- 4 Pencils
- 10 Straws
- 3 Spools
- 6 Film Canisters
- 6 Rubber Bands
- 200 cm of Masking Tape
- 2 Yogurt Cups
- 5 Hot Glue Sticks w/ Glue Gun
- 10 Index Cards
- 5 Paper
- 10 Pipe Cleaners
- 10 Wooden Craft Sticks
- 6 Clothes pins

Competition Supplies:
Water bottle, plastic tubs,
string, weights, & paper towels

Notes:

(1) Students may use all or part of the materials in the junk box. I allow the students to use any material inside the box. For example, if any of the materials come in wrappers or boxes, teams may use those for the device. The materials may be modified with the understanding that if a goof is made they will not receive new materials. Leftover materials may be used to make repairs if the device breaks during competition. No major design changes are allowed!

(2) To test the whirling wonders, provide a bottle of water and a plastic tub (such as rectangular storage tubs). The students will need to attach the string to the axle and squirt the water at the paddles on the water wheel. When the bottle is empty, measure the total amount of string moved during the trial. You will want to attach a small weight to the end of the string to provide some resistance.