CONSTRUCT A WELL-DESIGNED TRASH SLIDER

Dive into the laws of physics by creating a vehicle/slider that can race down an incline as quickly as possible while retaining the most water.

MATERIALS

- One empty 2-liter plastic bottle with a rectangular opening cut in the side (for the top of the vehicle body)
- Tape
- Rubber bands
- Measuring cup (to measure 500 milliliters of water into each vehicle)
- Assorted trash or recycled items, such as plastic water bottles, packing materials, bubble wrap, cloth, paper, coat hangers, cotton balls, golf balls, rubber, washers, etc.

METHOD

1. Build the racecourse. A ramp or series of slides can be made from cardboard posters taped together and propped against tables, chairs or a lectern. The course should include speeds bumps and/or other rough terrain.
2. Develop a plan. Explore available materials to see which are the heaviest or lightest and decide which will slide well across the table. Test some sample materials to see how they perform, then brainstorm different potential slider combinations. If performed as a team activity, discuss the tradeoffs between speed, steadiness and ability to hold water without spilling.
3. Create a design. Determine which materials to use as well as how to properly attach all components.
4. Construct your vehicle.
5. Test the designs. If necessary, encourage individuals or teams to modify the design for improved efficiency. What did you learn from the test? How could you make an even faster or sturdier slider?
6. Start the engines! At the beginning of the race, pour 50 milliliters of water into the rectangular opening at the top of the vehicle body and watch it speed down the racetrack.

DIG DEEPER

Change the angle and length of the track. Investigate the results of increasing potential energy (length and height of hill). How does it affect the acceleration and velocity of the trash slider?

Restrict the choice of materials. How does that affect performance?

Add or reconfigure speed bumps or other obstacles.

SOURCE

http://teachers.egfi-k12.org/trash-sliders/

NOTES

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