Stay-All-Day Activity (MS)
Organizer Notes

Wind-powered Vehicles:
Can you move it?

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Description: Students make a wind-powered vehicle and collect data to measure the distance the vehicle can travel in a marked roadway. The team with the farthest distance traveled within the roadway wins. Competitive.

Materials: for each group (2-4 students/group)
Quart ziploc bag 1 small cup (foam, paper) 2 straws
2 small binder clips 4 large paper clips 4 medium rubber bands
1 small cake plate (foam, paper) Piece of foil and/or cardstock (8 ½ x 11")
50 cm of masking tape Scissors

1 LARGE box fan – set to highest setting
Masking/painter's tape to mark off a ROADWAY (runway) Measuring tape

Procedure:

1. Set up the box fan near a plug/wall.
2. Using the painters/masking tape, create a starting line 30 cm in front of the fan. The starting line will be no wider than 1 meter with the fan in the center.
3. Use the painters/masking tape to make a roadway for the wind vehicles that is attached to the starting line and travels out on both sides at least 7-8 m
4. Each team will be given the ziploc bag with the materials in it, a pair of scissors and the 50 cm of masking tape. That is all of the supplies they will receive. No additional supplies or tape will be provided.
5. Teams must use at least 5 of the supplies given (except the tape/scissors). They can cut/shape supplies but for the supply to be counted, more than 50% of the item must be there and recognizable.
6. Give teams 10 minutes to begin designing their vehicle. They cannot use the fan during this design time.
7. At the end of that time, explain that teams will select one "spy" to go take a quick look at the other teams' designs. They will have only 1 minute to go and come back to their team.
8. Give teams 2 more minutes of design time/conversation.
9. Open up design testing with the fan for a total of 10 minutes – Teams can come and go as much as they like but only test with the fan during this portion of the competition. During this time teams' will also create a name for their vehicle.
10. Begin competition after the design testing time. Use a standard double elimination winner's bracket to determine who moves on to the next round (see attached).

Rules:

- The vehicle will sit behind the starting line in front of the fan. No part can be in front of the line.
- Fan will be turned on to highest speed. The fan director will tilt the fan down to get the vehicle started (no more than 15 degrees). ** The fan will be run by the director of the competition (no team members can touch/run the fan).
- If the vehicle stops moving, the director will count up to 2 seconds (1001, 1002…). If the vehicle starts again, count restarts. If the vehicle does not move, that is the final distance.
- Distance is measured from the starting line to the part of the vehicle farthest away.
- Once the vehicle exits the roadway (all parts are out), mark the place where the last part of the vehicle exited the roadway. That will be the final distance.
- Have teams use measuring tape to determine the final distance – competition director confirms distance.

Analysis

Draw a diagram and label the components of the wind vehicle

Describe the features of your wind vehicle that address the physical constraints of gravity, and friction? What observations & evidence can you provide to justify having these features?

Record the distance traveled in each heat that the car competed in. Record the average distance the car traveled.

Heat ->	1	2	3	4	5	6	7	8	9	Avg
Distance (m)										