

Balloon Jet Cars

Integrated Science: Physics/Design

Name(s): _____ Per _____

Introduction

Engineers develop cars, buildings, bridges, and all kinds of consumer products using the following steps. First, they formulate an idea—known as their conceptual design. They often create technical drawings, or blueprints, to communicate their idea. Next, they build a working model known as a prototype. They test the prototype, then use what they learned to evaluate and refine their design. Usually several prototypes are built and tested before the project is complete. The final model is then constructed full-scale, on site, or (in the case of a consumer product) produced in large quantities and sold in stores.

Materials

- 2 Drinking straws
- 1 Large index card
- 1 Wooden skewer
- Tape
- Scissors
- 1 round party balloon, medium size
- 4 Wheels

Procedure

Your goal is to construct a self-propelled, **wheeled** vehicle that can travel a minimum of 1.5 meters using only the materials listed above.

1. Work with your group to develop a conceptual design for your vehicle.
2. Create a detailed drawing that shows your design plan. Be sure to label the different parts of the vehicle.
3. Show your conceptual design drawing to your teacher. **At this point you will be given the materials listed above.**
4. Build a prototype.
5. Test your prototype.
6. Evaluate the design. Make changes to improve the vehicle's performance.
7. Repeat steps 1-5 as needed until you feel that the vehicle is ready for teacher evaluation.
8. If you have made changes to your vehicle, produce a final drawing, with labels, showing your final, tested design.

Results

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1. Demonstrate **for your teacher** how far your car can go. Measure and record the time elapsed during this demonstration trial. Don't forget units.

Total distance traveled: _____

Total elapsed time: _____

Teacher's initials: _____

2. Calculate the average speed of the car during its test. Show your work. Don't forget units.

3. Attach your conceptual drawings to the back of this paper. If you made revised drawings, attach those also. Be sure to label "original" and "revised" drawings.

Scoring Guide: 25 points total

Car meets requirements (wheels, allowed materials)	0	1	2	3	4	5	/5
Total distance travelled	0	1	2	3	4	5	/5
Car traveled in a straight line	0	1	2	3	4	5	/5
Quality of design plans – original and final, with labels	0	1	2	3	4	5	/5
Speed calculation	0	1	2	3	4	5	/5
Total	0	1	2	3	4	5	/25