

BALLOON RACERS

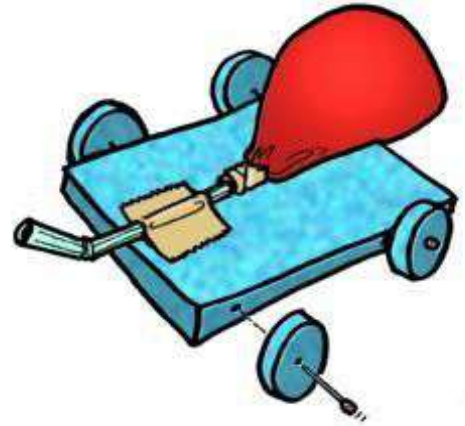
DATE DUE _____

OBJECTIVES:

- *To create a balloon-powered race car for a 5 m distance
- *To incorporate Newton's Laws of Motion

MATERIALS:

- ***ONE** 10-12" balloon
- *Various materials to construct racers (straws, cups, sticks, etc.)



RULES:

1. You must work alone...parents may supervise/advise, but the work must be that of the student.
2. The car must be powered only by 1 balloon blown up with lung power only. No mechanical devices/pumps allowed.
3. It must have at least 3 wheels. Wheels are defined as anything that is round and goes around.
4. The wheels **CANNOT** be wheels from a toy car or project made from a kit. They must be made out of something that was not originally meant to be used as wheels. No bearings allowed.
5. The car may not leave the ground.
6. The car must be capable of traveling at least 3 meters **in a straight line**. If it curves, it won't make it to the finish line! For every additional meter the car moves, one EC point (15 pt max.).

PROCEDURE:

1. You will assemble the car at home and bring it in on its due date.
2. On race day we will set up a track in the quad/MRP.
3. You will only get **ONE TRY** to race your car. Be gentle with your car so it works at race time! "Car insurance" is allowed via video on your phone/tablet. If you are using "insurance," then you will need to show a clearly, labeled track and yourself with racer in video.
4. Winning cars will be displayed on our web page and given a certificate!
5. These awards will be given in three categories
 - Most Creative
 - Fastest Racer
 - Farthest Distance

BLUEPRINT:

1. Use 8 ½ x 11" copy paper.
2. Illustration of racer in color.
racer.
3. Label all parts of your racer.
4. Label all functions of each part of

RUBRIC

RACER (50 points)

Travels at least 3 meters	_____ (25)
Has at least 3 wheels	_____ (5)
Wheels material (not originally meant to be used as wheels)	_____ (5)
Doesn't leave ground	_____ (5)
Inventive design (original/professional)	_____ (5)
Good craftsmanship	_____ (5)

BLUEPRINT (18 points)

Cover sheet w/name, period, and car name	_____ (3)
Diagram of racer in color	_____ (5)
Identification of each piece and function	_____ (5)
Data Table is complete	_____ (5)

CONCLUSION (32 points)

1. STATE Newton's 3 Laws of Motion & EXPLAIN how EACH is a part in the motion of car. _____ (15)
2. List the 4 types of friction and how each or any of these types of friction are present in the movement of your car? EXPLAIN how each type of friction relates to your car. _____ (12)
3. How did your balloon car turn out? What were some problems you had when building car? What changes would you make if you had to build it again? Did you enjoy this project and WHY? _____ (5)

TOTAL

_____ (100)

HELPFUL HINTS:

There are several important things to keep in mind when designing and building your balloon racer.

The first thing to do is choose the material to build the chassis or body of the car. The chassis should be both light and sturdy, for this reason Styrofoam makes a very good chassis. It is also important to design a chassis that is long enough. Short cars tend to spin out more often than longer ones. A good car should be about 30 cm long.

The second thing is to build and mount the wheels. Wheels can be made out of about anything that is round, such as CDs caps and lids. The hard part, however, is getting them mounted straight with little friction. If the wheels are not mounted straight or are not free to spin smoothly, the car will not perform well.

Once the wheels are mounted on the chassis it is time to put a balloon onto the car. Having the balloon attached to a pen barrel so that the air comes out in a smooth manner helps.

If the car has a sturdy but light body, free moving wheels and a good power supply, you are well on your way to being a balloon racer champion.

GOOD LUCK!