Gagarin’s Balloon Thrust

EXPERIMENT

The key to getting a rocket to leave the atmosphere and go into orbit is thrust, the power needed to give it that essential speed. And in order to achieve that sort of power, you need to have a reliable fuel supply—and enough of it.

This experiment uses balloons to help you make the connection between fuel, thrust, length of flight, and the distance covered. Basically, you’re the one supplying the fuel (with your breaths), which in turn determines the amount of thrust that your balloon rockets will have. Then you can see the direct relationship between thrust and the length of the flight.

3. Blow up a balloon using a series of same-size breaths: Have your friend count those breaths and mark them under “Size.”

4. Pinch the balloon shut and take it to the launch site.

5. Have your friend get ready to time the flight from the moment you let go.

6. Keeping the pinched end pointing at you, hold the balloon out and let go.

7. Ask your friend to mark the time under “Length of Flight,” and then you can both measure the distance it flew and enter that under “Distance.”

8. Repeat steps 3 to 7 for each balloon.

9. See whether you can draw any conclusions between the size of the balloon’s fuel supply (the number of breaths) and the time and distance.

10. If you want, you can make charts of these relationships using “Number of Breaths” as the Y axis (the upward-pointing one) and “Length of Flight” and then “Distance” for the horizontal X axis.

Choose about 4 or 5 balloons of different sizes and record them as “1” to “4” (or “5”) on your paper. Leave a good bit of space between each balloon entry, because you’ll be adding more information.

For each balloon entry, mark “Size,” “Length of Flight,” and “Distance.”