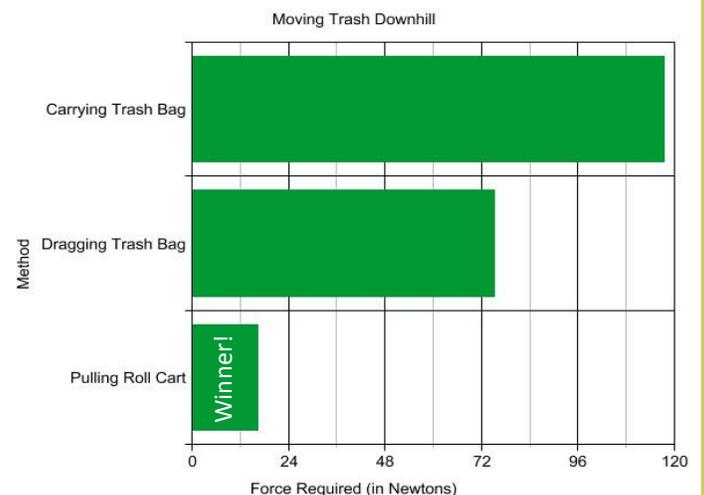
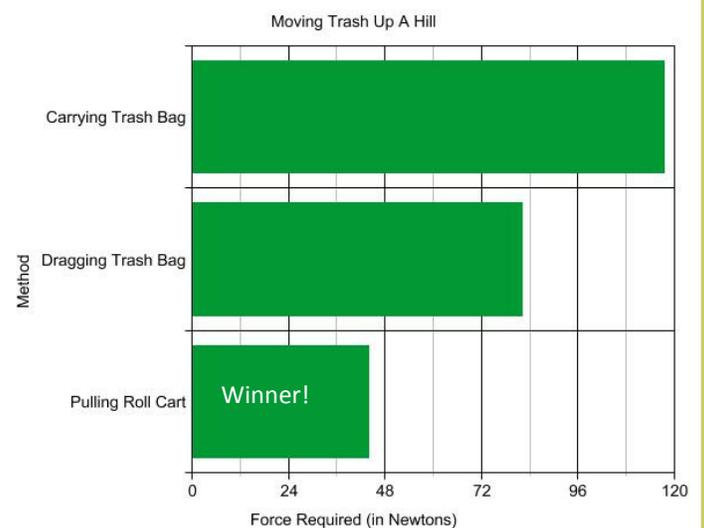
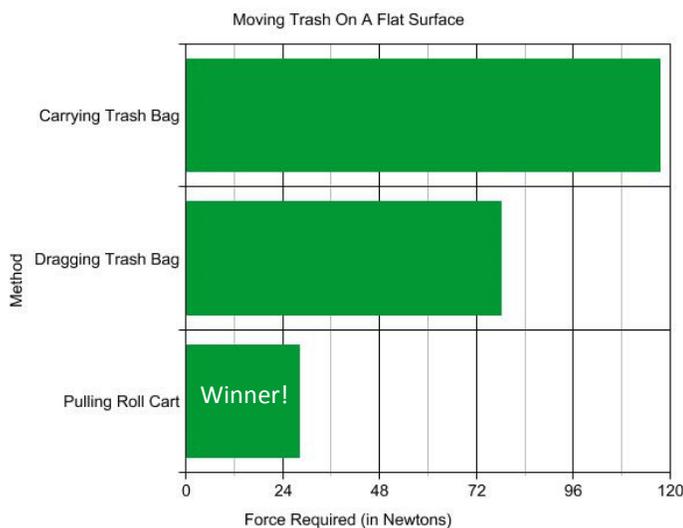


Columbia Roll Carts vs. Trash Bags

The City of Columbia has been considering a change to how trash is picked up from homes. Currently all trash and recyclables are placed in plastic bags. It has been proposed that residents will receive rolling trash bins (roll carts) to replace the bags. Supporters of this plan say that the roll carts will be more convenient, store more trash, and will be easier for the city to pick up. Opponents of the change say that the roll carts will be too heavy to move, will be blown all over city streets, and will be dangerous to some people if they roll out of control down a driveway. The Columbia Public Schools Science and Practical Arts departments requested a sample of the roll carts so they could perform a series of tests on them. Newspapers are filled with letters to the editor but those letters do not require actual proof or data. In science it is important to not only develop your hypothesis but to also test your hypothesis.

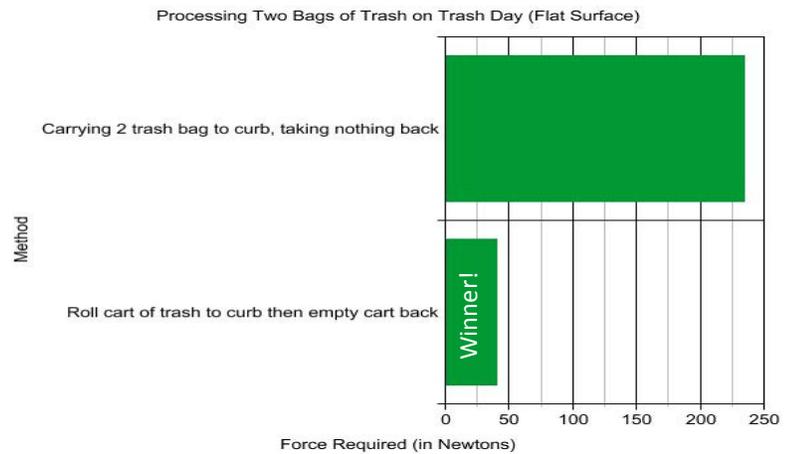
Force Required Tests (Roll Carts Win!)

After reviewing opinions called into newspapers, it was clear that one of the biggest controversies was the ease of transporting trash from the house to the curb. For this test a spring scale was attached to both a roll cart that contained 20 pounds of trash and a trash bag that contained the same trash. For consistency, the roll cart was pulled while still flat on the ground. In other words, the roll cart was not tilted back to prevent the dragging of the bottom on the ground. Tilting the roll cart back would have decreased the required force even more.



Capacity (Roll Carts Win!)

When you take a trash bag to the curb you never have to bring it back to the house. With a roll cart you must take the full roll cart to the curb then bring the empty cart back to the house later. Multiple samples of roll carts were tested and the majority of the roll carts held 3 normal-sized full trash bags. Most households have more than one trash bag out to the curb per week but they only carry one trash bag to the curb at a time. The graph shows the total Newtons of force used to process two bags of trash on trash day using both the roll cart and trash bag method.



Critter, Strength, and Wind Tests (Roll Carts Win!) (Roll Carts Win!) (Tie!)

Most trash has food waste in it and that attracts critters. The science department conducted a test that simulated the clawing at the trash by animals. The full trash bag was ripped open at the first swipe of the simulated claw while simulated claw was never able to reach the trash in the roll cart even after 100 claw swipes.

Next, both roll carts and full trash bags were hit with a car. The trash inside the roll cart remained inside while the trash inside the bags was spread due to the bag ripping open.

Finally, opponents of the roll carts have been worried that wind would blow the roll carts all over the streets. That would be a dangerous scenario. The roll carts were tested using fans and leaf blowers. Both full and empty roll carts could not be toppled using the average winds seen in a thunderstorm. If a severe wind did tip a roll cart over, it would likely stay in place due to the greater surface area while horizontal. The tests indicate that wind will not be a significant factor in either roll carts or bags.

Other Uses Test (Trash Bags Win!)

Next, potential other uses of both roll carts and trash bags were tested. For example, let's suppose you were hiking or camping and it started to rain. Oops...you forgot your rain coat. Which could get you out of this situation better—a roll cart or a trash bag? Our tests found that a trash bag makes a better emergency poncho than a roll cart.



Our Conclusion

Opinions are great...however science can not rely on opinions. To make a scientific claim, multiple tests need to be run and analyzed. Data from multiple trials of scientific testing show that roll carts stand up to their claim of being easier to use in almost all cases...but just not for a poncho. **ROLL CARTS WIN!**