Physics 04-01 Bumper Testing Lab ***Name: _____***

Objective

- Create a bumper resulting in the lowest force during a collision.

Materials

- Dynamics track
- Lab cart with built-in force sensor
- Tablet or computer with SparkVue App
- Paper
- Tape
- Scissors

Setup (before class)

1. Arrange dynamics track so it slopes mildly.
2. Place a stopping bar at the end of the track. The bumper will rest against it.
3. Place a second stopping bar at the point where the cart is to be released. The force sensor should not quite max out with no bumper in place.

Procedure

1. Each team makes a bumper out of paper and tape.
    a. 2.5 cm thick × 4 cm high × 10 cm long
    b. Do not use excessive tape.
    c. Paper is the structural component; tape is only to hold the paper together.
    d. No wedges or parts to go under/around force sensor to slow it by friction. The sensor should hit the bumper directly.
2. The bumper is placed against the end of the track.
3. The cart is released from a distance as set by the teacher.
4. The maximum force is read from the sensor.
5. What is your group's lowest force? _____ N
6. What could be done to lower the force? _____
   _____

Grading

+5pts = lowest force
+2pts = 2nd lowest force
10pts = less than 20% max force 4.0
9pts = less than 30% max force 4.0
8pts = less than 40% max force 3.5
7pts = less than 50% max force 3.5
6pts = less than 60% max force
5pts = less than 70% max force
4pts = less than 80% max force
3pts = less than 90% max force
2pts = less than 100% max force
0pts = no try