Ballistics Car Lesson Plan

Amount of time Demo takes: 3-5 mins.
Don’t try this at home!

Materials
- Car
- Metal pin on string
- Metal balls
- Something to push the ball down with (pen, pencil, etc.)
- Level
- Sheets with equations/diagrams

Set-up Instructions/Instructional Procedure
1. Find a clear and level surface.
2. Put car on table.
3. Load ball in gamel.
4. Prop the lever up with the pin.
5. Once the ball and pin are secure, put the car on one end of table. Make sure wheels are not touching body of car.
6. Give the car a push to get it moving - pull the pin when the car gets to a constant speed (make sure car doesn’t run off table.)

SAFETY!
- Wear safety goggles!
- Hang a sign saying not to lean over table/stay back

Lesson’s Big Idea
- Projectile motion
- Newton’s laws of motion
- Acceleration due to gravity

Background Information
- There is a horizontal speed and a vertical speed that act independently of each other. The horizontal speed is constant and the vertical is not. Gravity acts in the vertical direction and only pulls the ball back down. The
horizontal motion of the ball keeps pace with the car.

**Assessment/sample questions you can ask**
1. What force is making the ball come down?
2. Why does the ball land back inside the cart?
3. If we pushed the cart slower or faster could we make the ball not land in the cart?

**Clean Up**
- Put all back in the proper bin

**References**
- [http://www.arborsci.com/media/datasheet/P3-3527_DS.pdf](http://www.arborsci.com/media/datasheet/P3-3527_DS.pdf)

**Next Generation Science Standards**
- K-5
  - K-PS2-1
  - 4-PS3-1
- 6-8
  - MS-PS3-7b
- 9-12
  - HS-PS2
  - HS-PS3