

Scrambler 2007

B Division (Middle School)



Understanding Basics

- Device Parameters (size, positioning)
- Egg Transport System (the car)
- Propulsion Device (the launcher)
- Energy Source (falling mass)
- Track parameters (width, length, surface)
- The EGG (size, location, mounting)
- Operating the device
- Scoring

Device Parameters

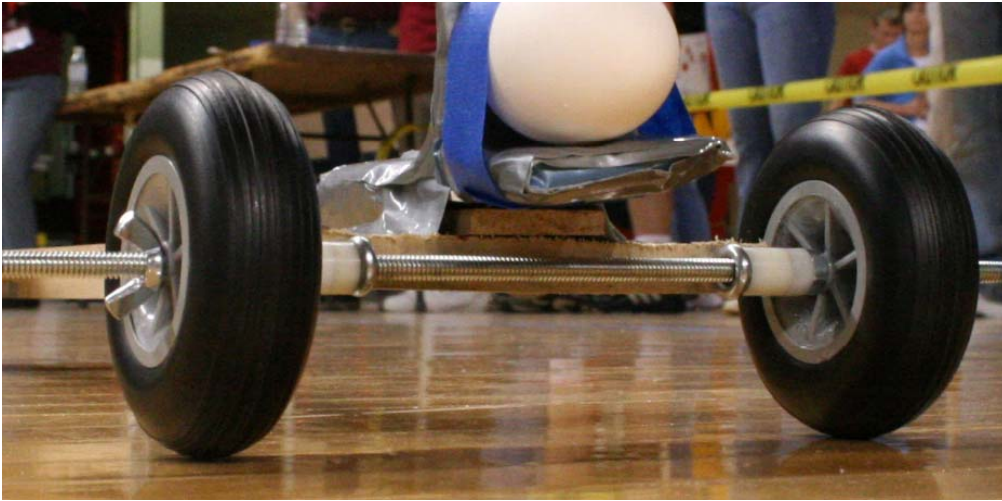
- Fit within .75m cube while in the ready to launch position
- No electronic devices
- No tethers or remote control
- Falling mass may not exceed 2.0 kg
- **IMPOUND EVENT**

Egg Transport System



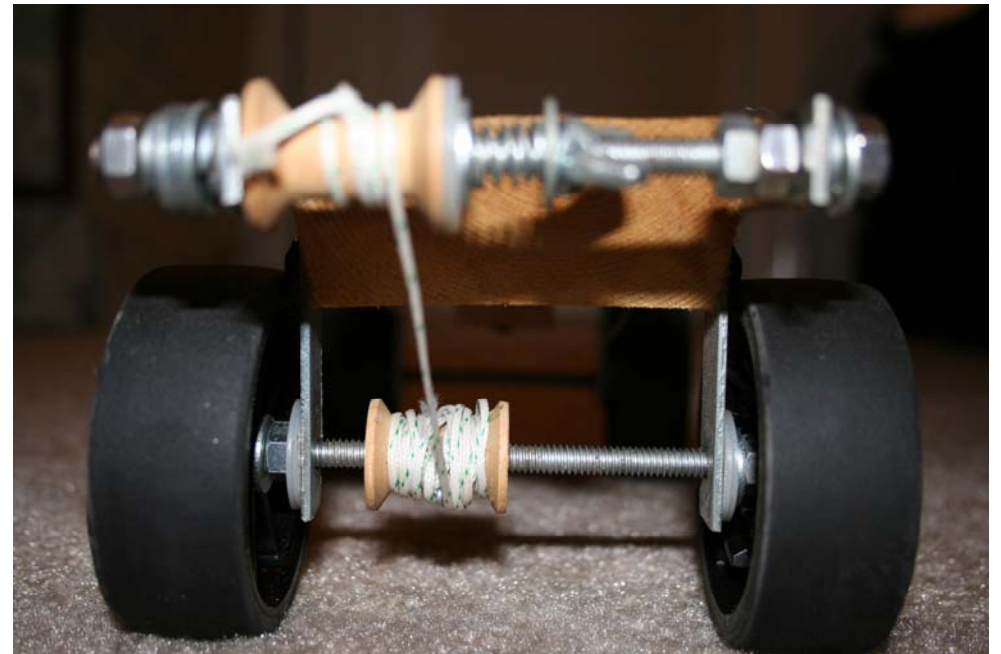
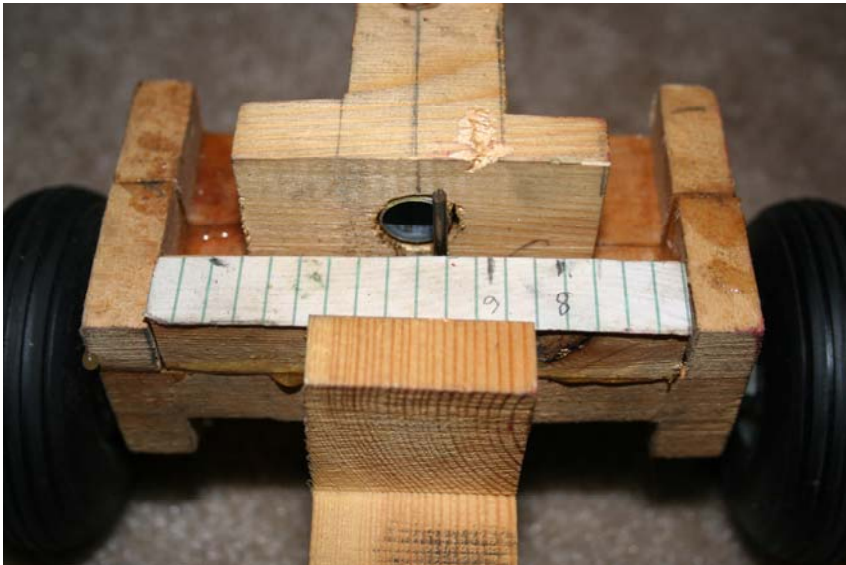
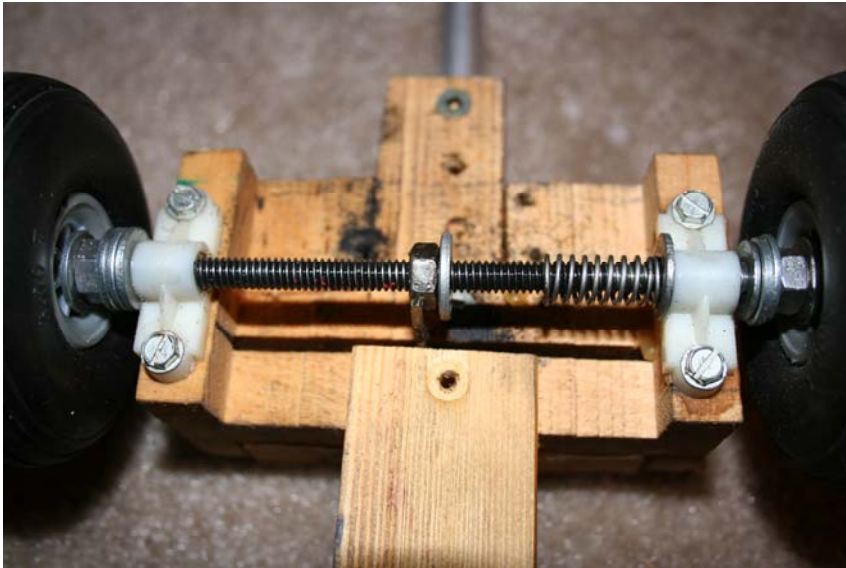
Egg Transport System

- Wheel and Axle: Straight, Sturdy, Traction



Egg Transport System

Braking Systems: 2 Basic Types



Propulsion Device



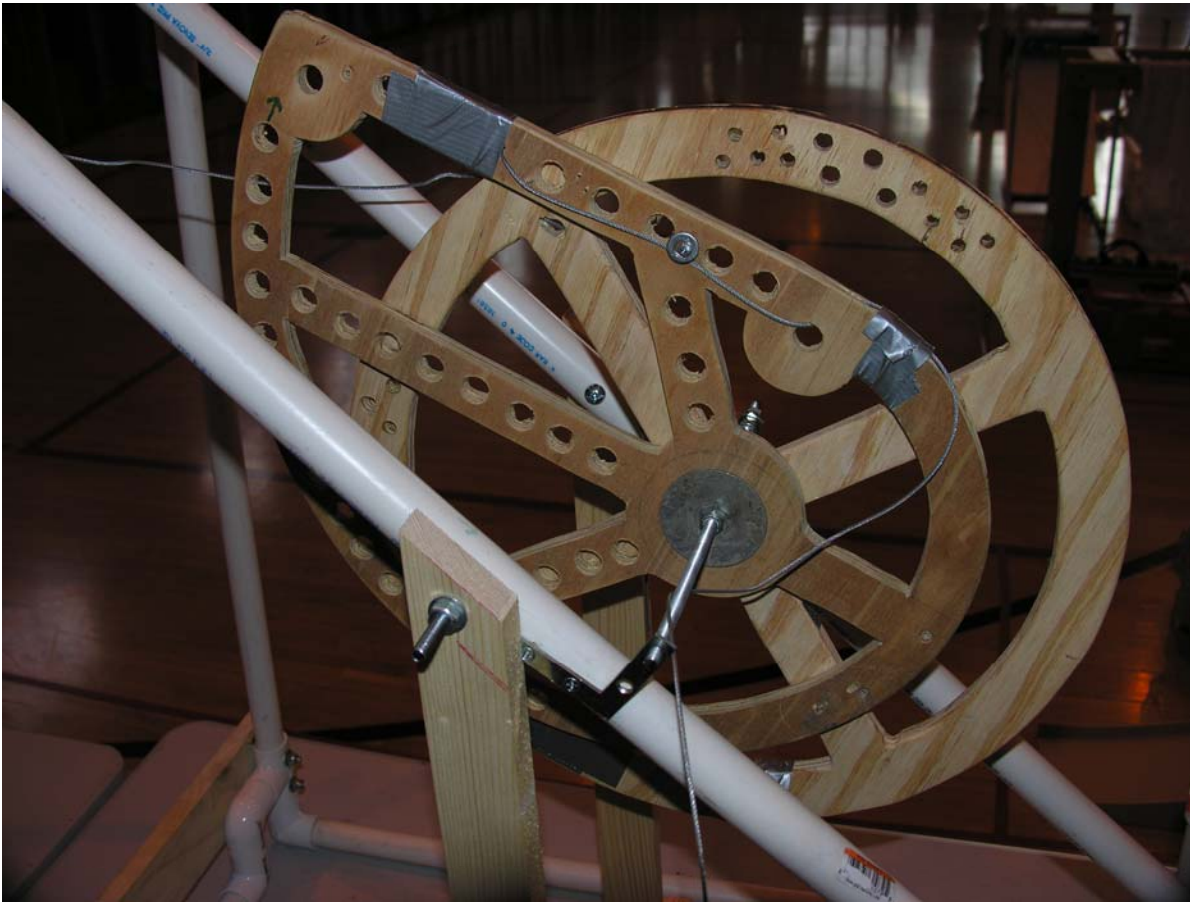
- Straight fall
- Mass falls, pulling a string through a series of pulleys that launch the vehicle

Propulsion Device- Push Arm



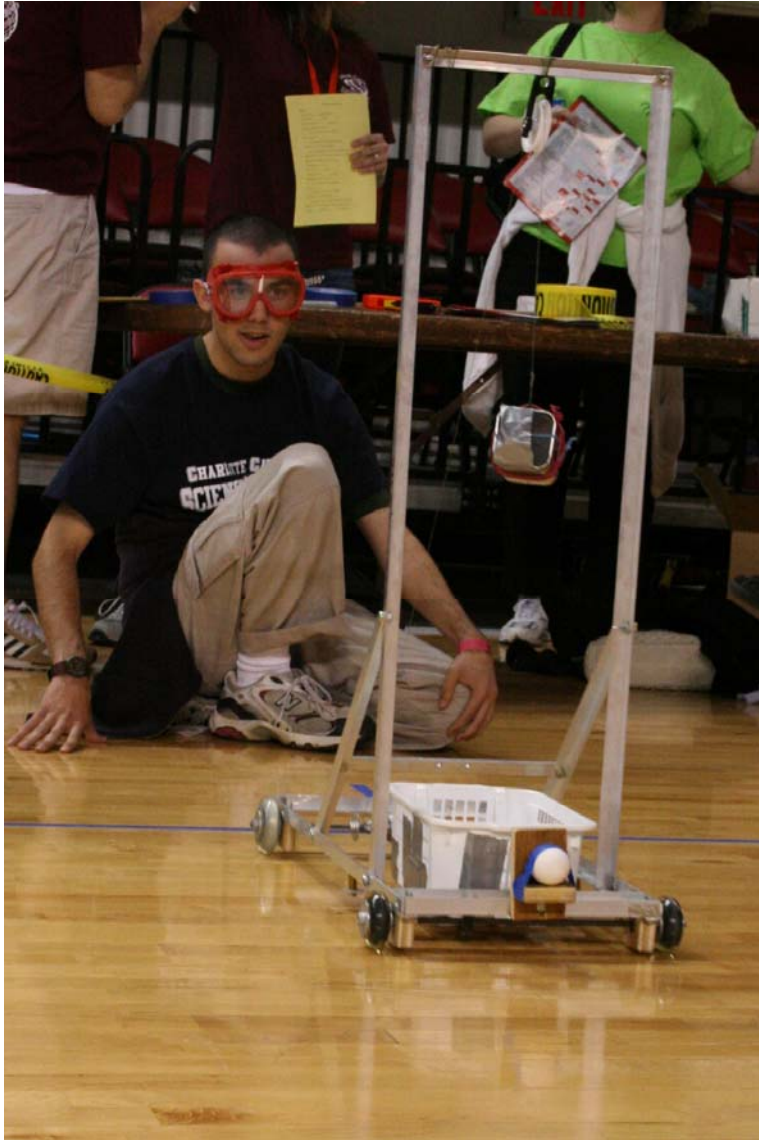
- Mass is attached to a swinging arm that pushes the vehicle forward
- The weight of the arm is included in the total falling mass
- Make sure arm is within device dimensions **while in the ready to launch position**
- Arm may swing out of device dimensions during or after launch

Cam System



- Very advanced, increases the force used to propel the car

Combined



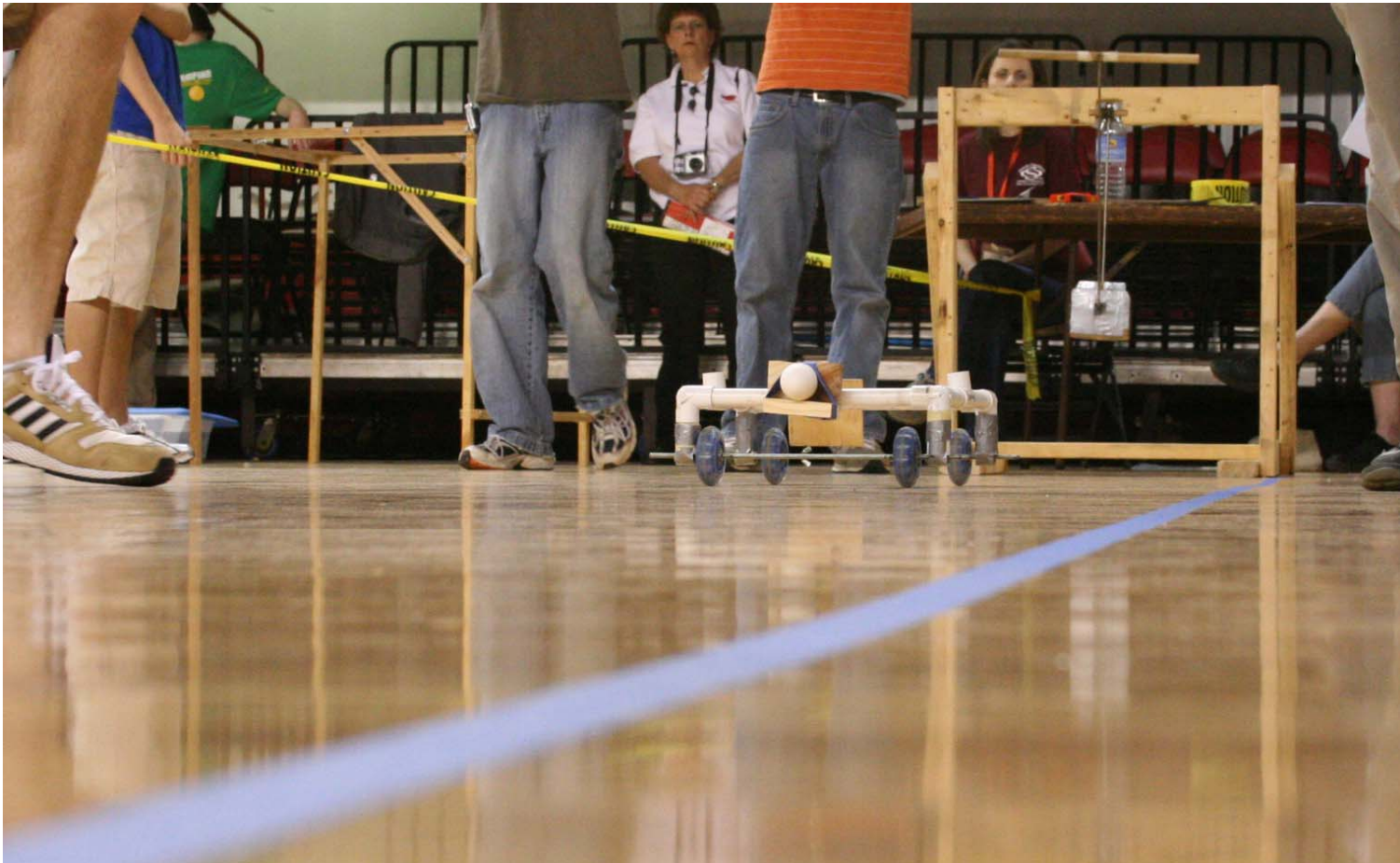
- The propulsion device can also travel with the vehicle

Energy Source

- Falling mass not to exceed 2.0 kg
- This includes the weight of any items attached to the actual mass that contribute to its potential gravitational energy
- Additional mechanical energy sources may have energy transferred to them during the run as long as they are in their lowest energy state prior to initiating the run.
- Braking systems may use additional sources of mechanical energy

Track Parameters

- Straight, smooth, hard surface
- 2m wide by 8-12m long, .5m increments



The EGG

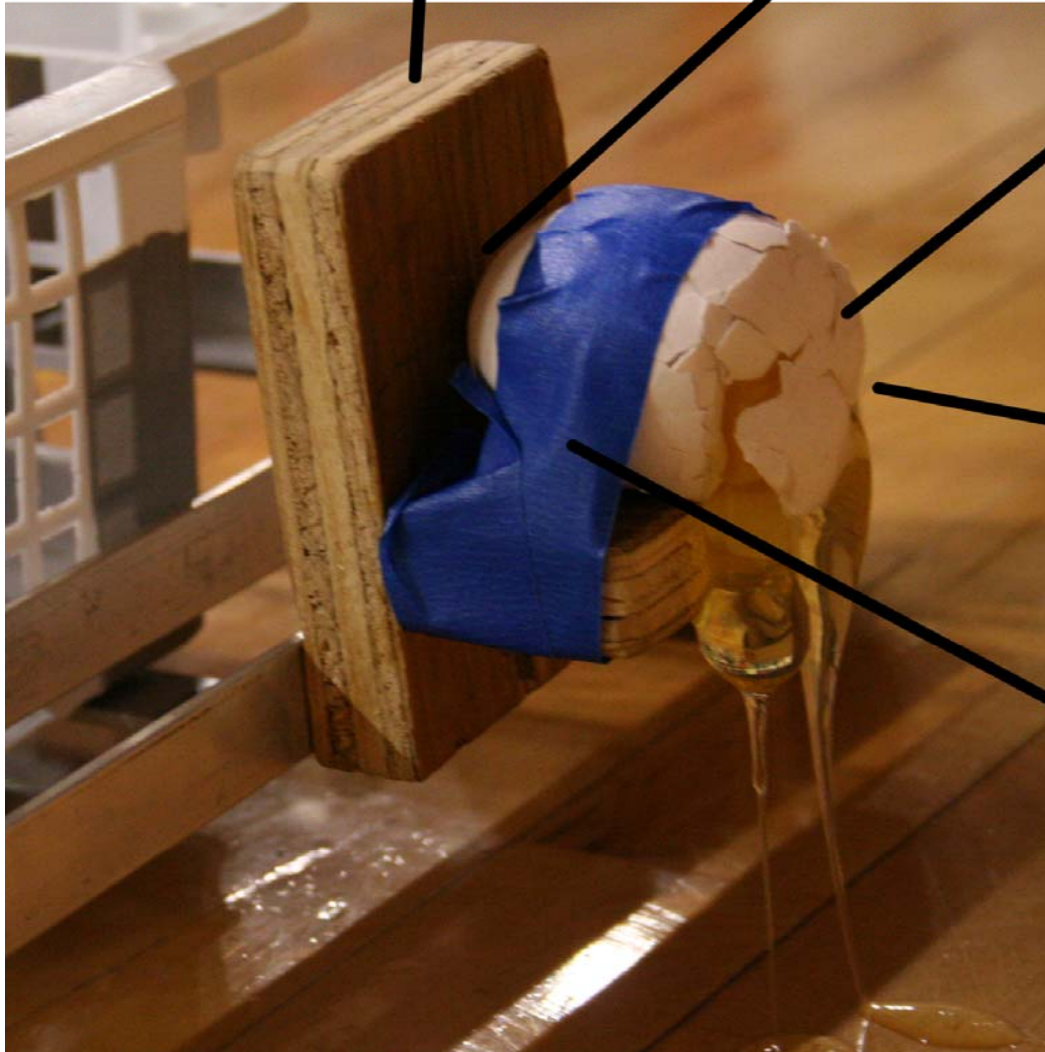
Backing at least 4cm x 4cm
and 1.25 cm thick

Back of egg touching the
rigid backstop

Egg mounted with
front 2 cm
unobstructed

Egg mounted with
pointed end forward,
between 5cm and 15
cm above the floor

Tape can be used to
mount egg, but cannot
be on the front 2 cm



The Egg

- Must be an uncooked, Grade A large chicken egg
- The Judge provides the egg
- Tape will be provided to secure the egg to the vehicle



Unbroken



cracked, not broken



Cracked and broken
(note the wet mark)



Broken

Device Operation

- Typo in rule #4L. The team may also initiate the run by releasing the egg transport. While this should be understood from reading rule #4K, there will be a clarification posted shortly.
- Teams are allowed 10 minutes to make 2 run attempts
- **SAFETY GOGGLES!!**

Device Operation

- Best of 2 runs, but students only get 1 egg
- No outside coaching once students have entered the competition area
- Students are allowed to adjust their vehicle once it is set to launch, as long as the adjustments do not increase the falling mass
- Students cannot 'chase the car' down the track
- Did I mention SAFETY GOGGLES??

Scoring

- LOW SCORE WINS
- Best single run used, NOT average
- 3-Tiered event:
 - Tier 1- No penalties or violations
 - Tier 2- Competition penalties
 - Tier 3- Construction violations

- Scoring Formula:

$$\text{Performance Value} = (2T + D)$$

where T is time in seconds and D is stopping distance in cm

- Penalties and Violations are tallied, and multiplied by the performance value to rank teams in lower tiers

Let's Play!



Any questions or comments, feel free to contact Kelly Fair at kellstuh@gmail.com