



Scrambler

Div B

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Tech Committee Members

Agenda

- **Basic Event Description**
- **Rules**
 - **Construction Parameters**
 - **Track**
 - **Competition**
 - **Practice Log**
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 - **Distance Score**
 - **Bonus**
 - **Penalties**
- **Summary / Closing**

Event Description

Teams must design, build, and test a mechanical device, which uses the energy from a falling mass to transport an egg along a track as quickly as possible and stop as close to the center of a Terminal Barrier (TB) without breaking the egg.



Rule Corrections & Clarifications

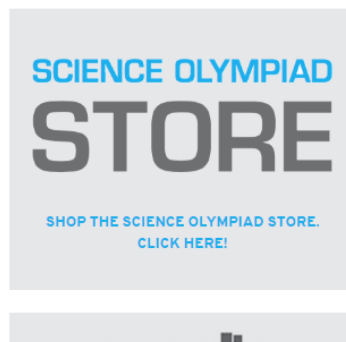


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RULES CORRECTIONS

Submit a Question is now open for the 2025 Season. Official Rules Clarifications/Corrections are made to clarify or correct the rules in the Science Olympiad Rules Manuals. Rules Clarifications are replies to commonly asked questions. If a response changes the meaning or corrects a rule it will be posted as an Official Rules Correction. The Official Rules Corrections and Clarifications apply to all states and all tournaments and originate at the National level (please check your Regional or [State Website](#) for special updates pertaining to your regional or state events). Click here to view [Event Clarifications](#) or to [Submit a Question](#). The official event rules can be found in the Science Olympiad [Rules Manual free online](#); each registered [member](#) must join through their state Science Olympiad organization to participate.

2025 SCIENCE OLYMPIAD OFFICIAL RULES CORRECTIONS



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SUBMIT A QUESTION AND RULE CLARIFICATIONS

The Submit a Question System for the 2025 season is now open!

The Submit A Question function allows participants, coaches, Event Supervisor and volunteers to get answers for specific clarifying questions regarding what's published in each year's rules. Everyone should make certain they are using only the current year's rules, which are found free online on [this website](#). While originating at the national level, these Official Rules Corrections and Official Rules Clarifications apply to all states and tournaments. In addition, Science Olympiad participants should check Regional or State Websites for local updates that pertain to local events. Any team that wants to participate in Science Olympiad tournaments must first be a member of their [State Science Olympiad](#) organization.

To Submit A Question or view a posted Rule Clarification, please select one of these five categories:

[Division B Events](#)

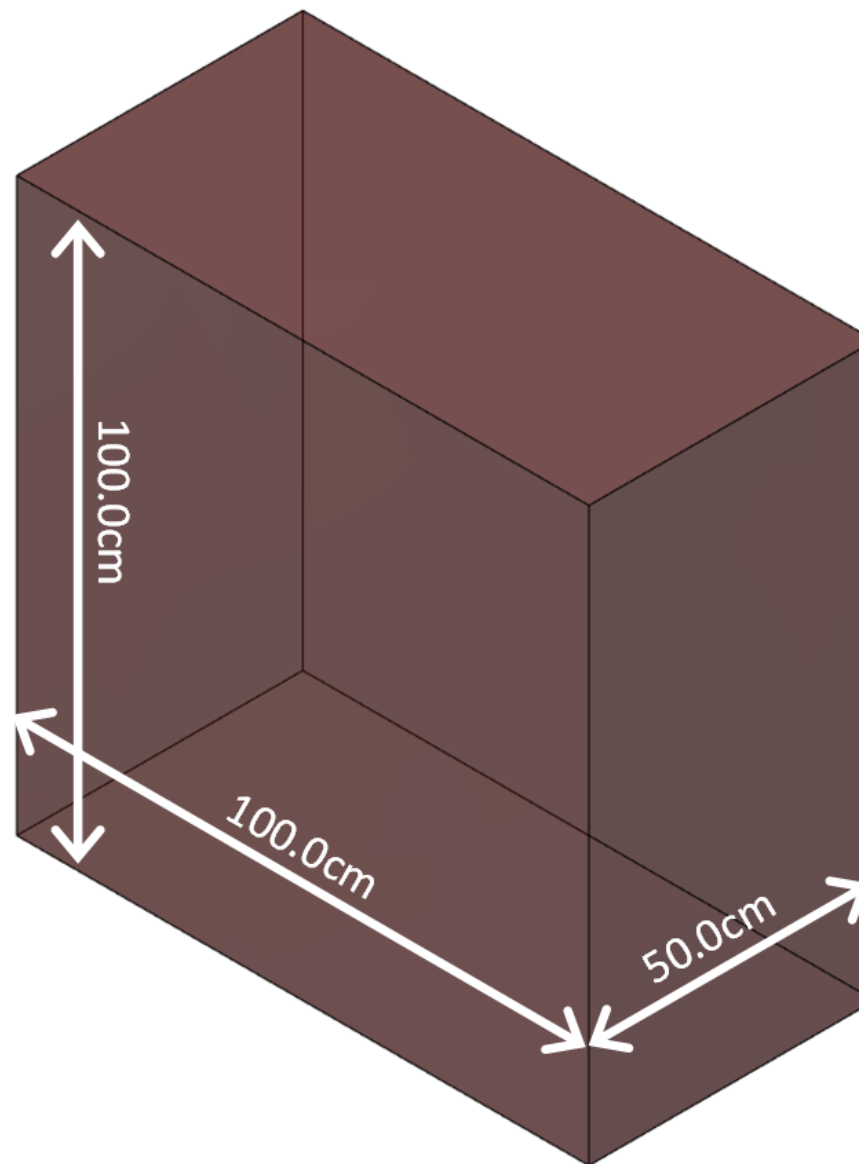
[Division C Events](#)

[General Questions](#)

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Construction – Size

- The entire Scrambler including the egg and falling mass, in the **ready-to-run** configuration, must completely fit within an imaginary rectangular box
- Base and Height are defined in rules. Do not rotate dimensions

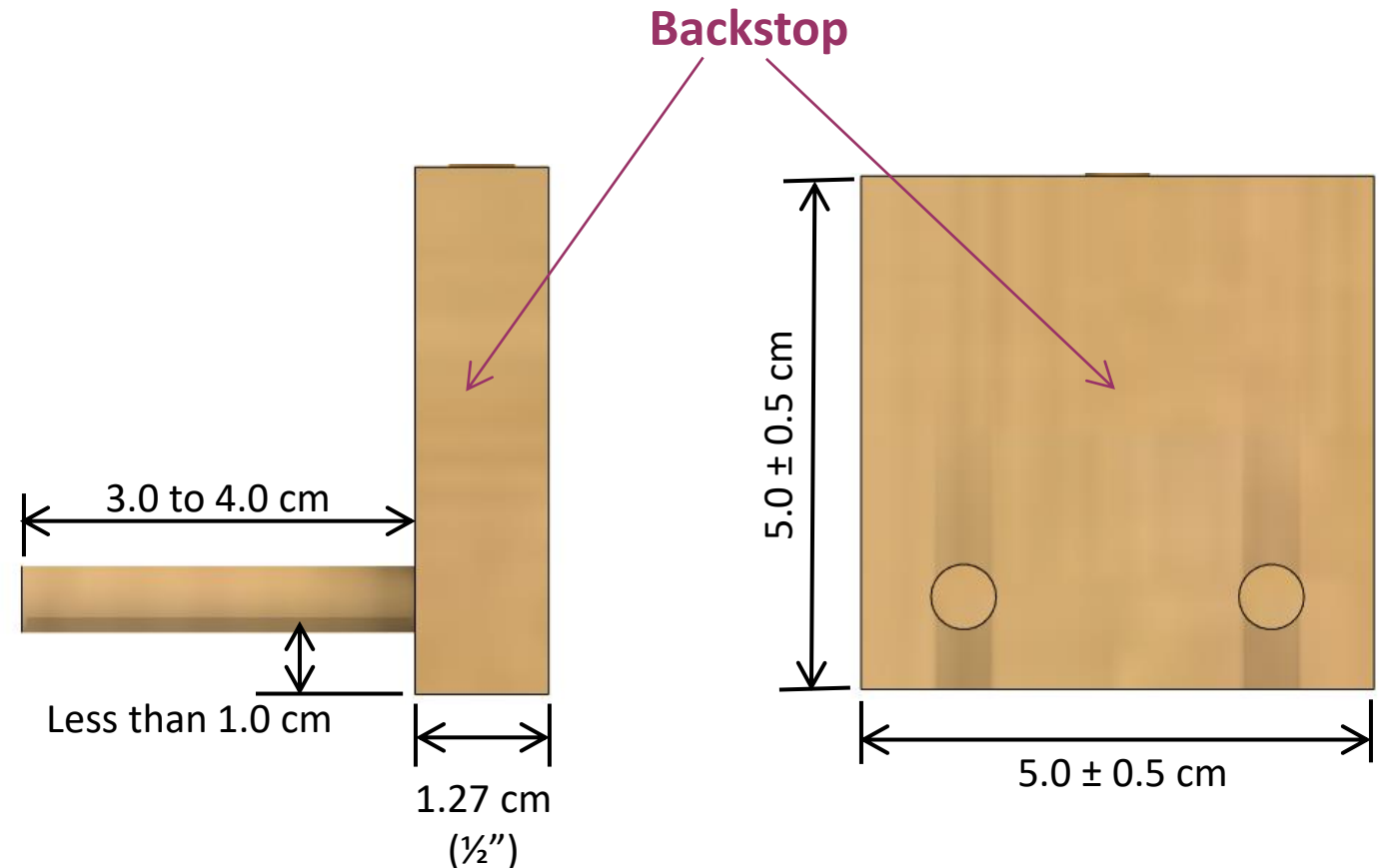


Construction - Energy

- All energy used to propel the Vehicle must come from a falling mass not to exceed **2.00 kg**
- Falling mass does not need to travel with Vehicle
 - Team's choice
- Falling mass must NOT directly contact the venue floor
 - Must use a pad or similar protective cushion
- Falling mass must be impounded and detached from Scrambler
 - Event Supervisor will measure the falling mass before the 8-minutes

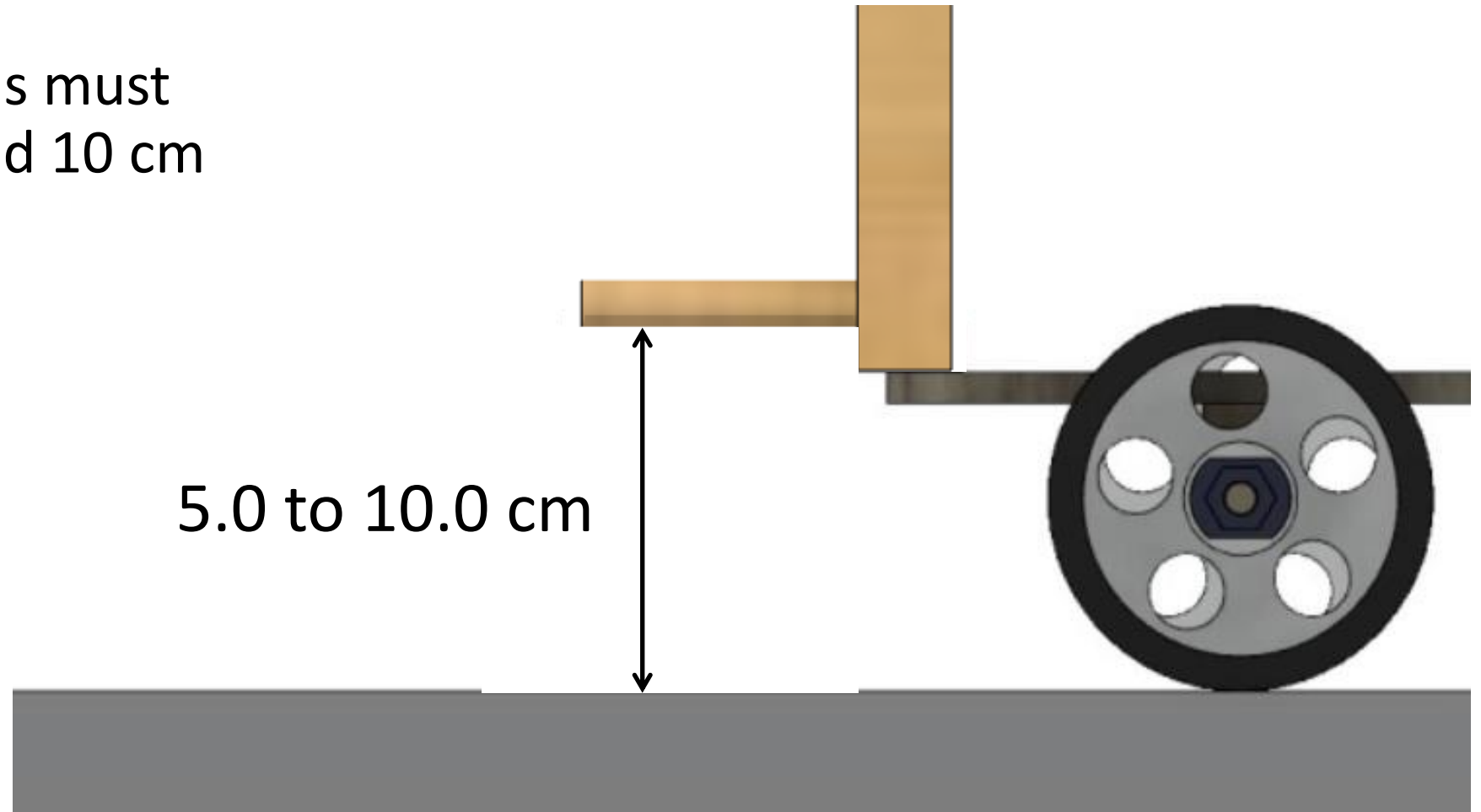
Construction – Egg Holder

- Backstop must be solid, rigid, unpadded and flat
- Backstop must be attached in a **rigid** method
- Egg rest on two $\frac{1}{4}$ " to $\frac{3}{8}$ " wooden round dowels



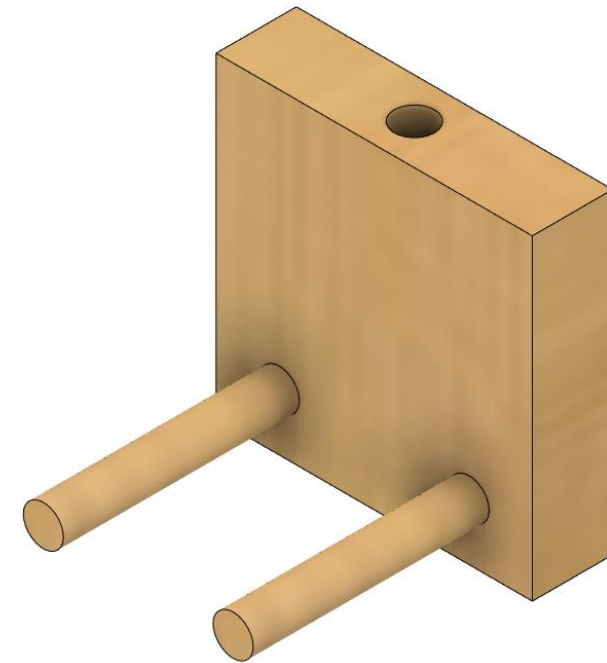
Construction – Egg Holder

- Bottom of dowels must be between 5 and 10 cm above track



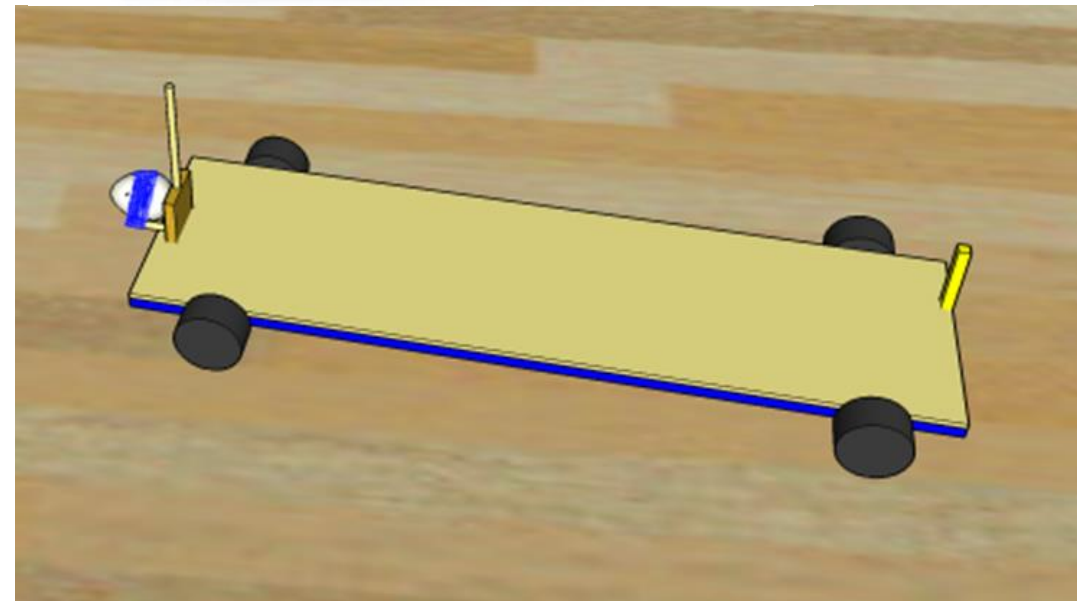
Construction – Egg Holder

- **Common Construction Violation**
 - Not Correct Size or Round Wooden Dowel Rod
 - Not between 5 to 10 cm from floor
 - Not correct dimensions
- **Very Important Dimensions**



Construction – “Egg”

- Event Supervisor (ES) will provide uncooked grade A large chicken egg.
- Students select the egg before 8-minute time
- Students tape the egg to the Vehicle
 - No tape placed on front or rear 1.0 cm of egg
 - Egg’s rounded end must be touching the backstop and visible to ES
 - At ES discretion, egg may be placed inside a thin transparent plastic bag.

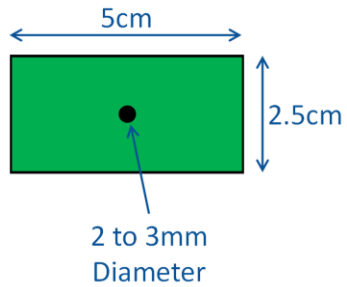


Construction – #2 Pencil

- Competitors must design the Scrambler to start by using a #2 pencil provided by the Event Supervisor
- The pencil may be the release mechanism itself and may extend beyond the dimensions of the imaginary box



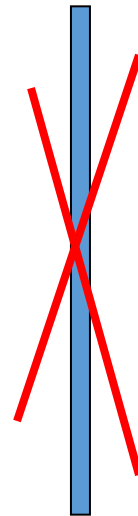
Track Setup – Start & Target Points



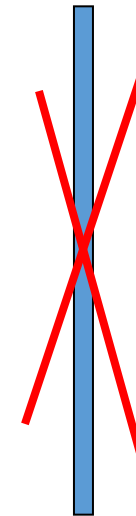
Start Point

Dot Centered on
2.5cm by 5.0cm Tape

**Track
Simplified!!!**



**The old Timing Lines
are gone!!!!**



Terminal Barrier

At least 25cm tall



7.0 to 10.0 meters

Intervals

- Invitationals / Regionals 0.25m
- States 0.10m
- Nationals 0.01m

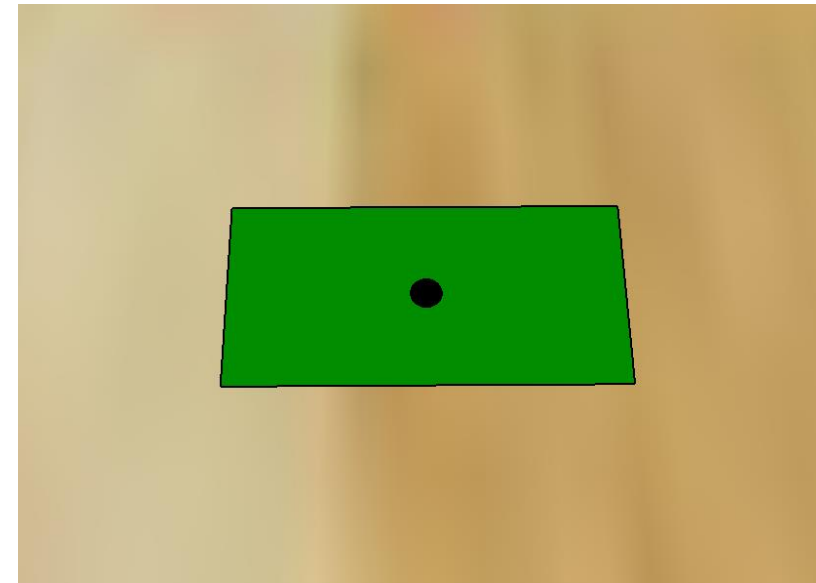
Competition – Event Time

- 8-Minutes for 2 Runs
- Participants are done after the 2nd run or the 8 minutes is reached
- Adjustments or repairs are made during this time
- Event supervisor measurements are not included in 8-minute time



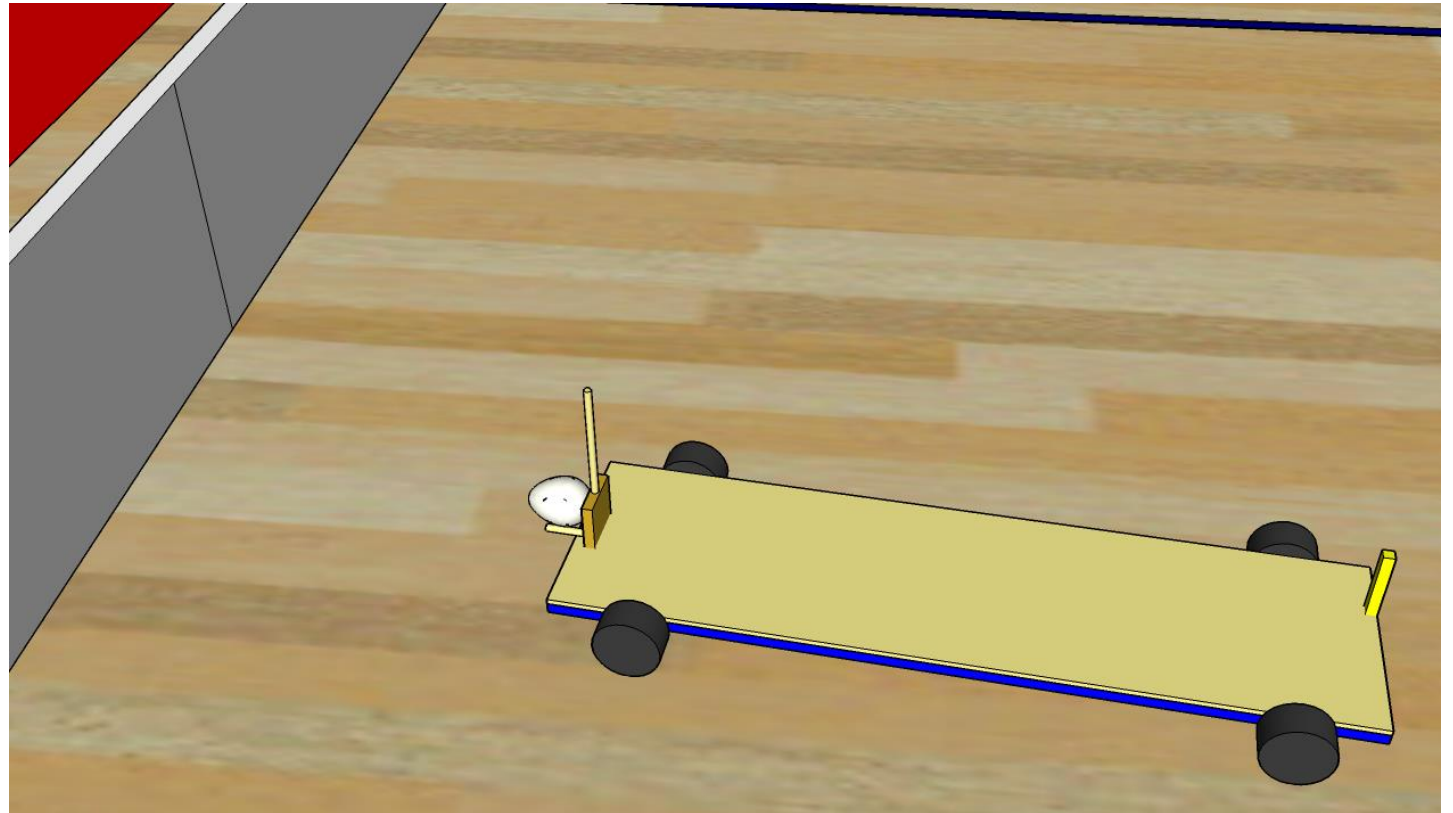
Competition – Ready-to-Run

- In the ready-to-run configuration, the Vehicle's Measurement Point (Tip of the Egg) must be over the Start Point



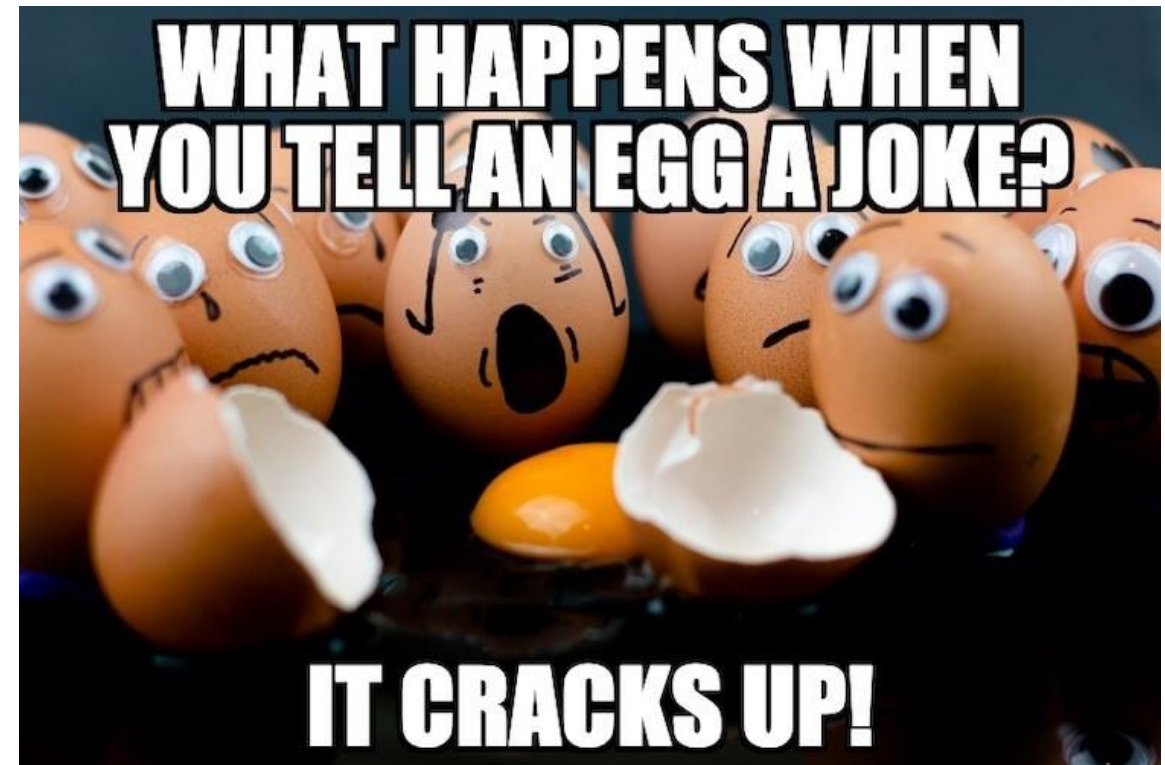
Competition – Egg and Terminal Barrier

- Goal to stop as close as possible to the Terminal Barrier (TB)
- No part of vehicle may contact the TB ahead of the egg



Competition – Broken Egg Penalty

- Breaking the Egg is a Competition Violation
- A broken Egg is defined by a cracking the egg enough to leave a wet spot on a paper towel
- If egg breaks on 1st run, then there is no 2nd run which is scored as a Failed Run



Competition – Failed Run

- Distance or Time cannot be measured
 - e.g. participants pick up the vehicle before measurement
- Vehicle starts before Event Supervisor is ready
- Team pushes the Vehicle down the Track
- The Run does not start within 8-minute time
- 2nd Run is Failed Run, if egg broken on 1st Run

Practice Log - Optional

A Practice Log is recommended but not required.

The Practice Log may contain paper for the competitors to use and must be impounded in order for the competitors to use during the competition.

		Distance					
	Target	From	Run	Motor	Brake	Aiming	
Run #	distance	Target	Time	Speed	Winds/Setting	Offset/Angle	Correction

Impound Event



- Scrambler is an Impound Event
- Teams must impound the following before the start of the 1st time slot
 - Scrambler (Vehicle, Launcher, Mass)
 - Alignment Devices (if used)
 - Practice Log (if used)
 - Additional / Spare Parts



Scoring



Final Score is the better of the 2 Run Scores plus any Final Score Penalties

Run Score = Distance Score + Time Score + Run Penalties

Scoring – Time Score

Time Score = Run Time

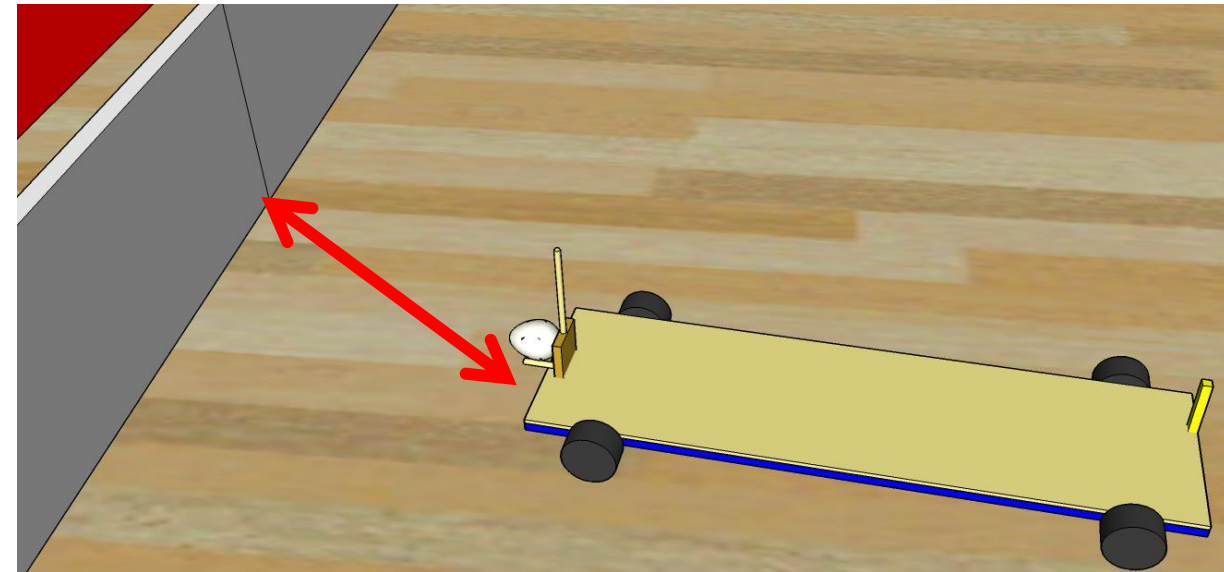
The Run Time begins when the Vehicle moves and ends when the Vehicle comes to a complete stop

Failed Runs will be recorded as 0.00 seconds

The old Timing Lines are gone!!!!

Scoring – Distance Score

- Vehicle Distance
 - Point to Point Measurement from the Target Point to Vehicle's MP (Tip of Egg)
 - Measured to nearest 0.1cm
- Distance Score = Vehicle Distance * 2 point/cm
- Distance Score for a Failed Run is 2500 points



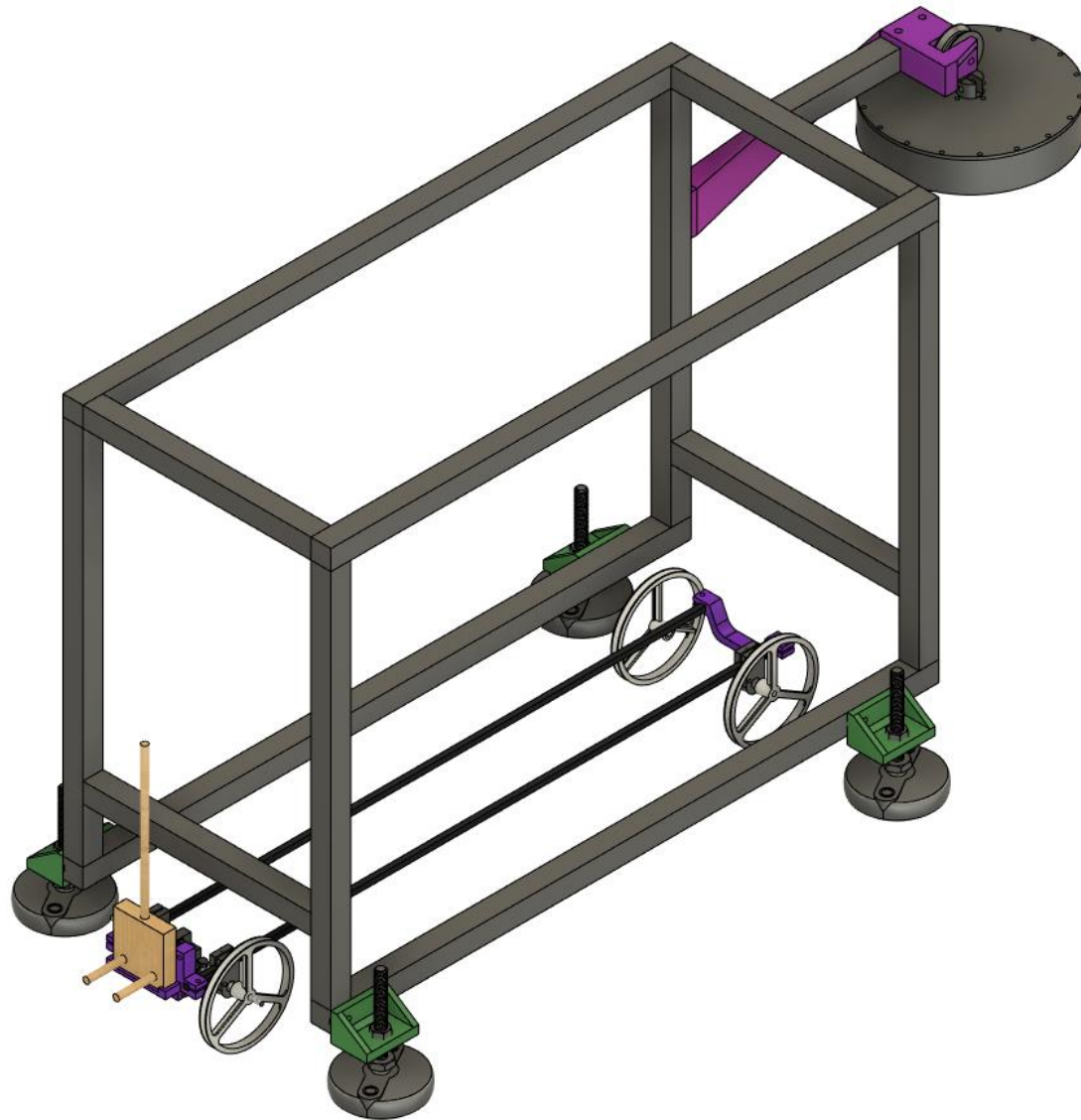
Scoring – Run Penalties

- Competition Violation: 150 points added to the Run Score **per violation**
- Construction Violation: 300 points added to the Run Score **per violation**
- Failed Runs can be assessed violations.

Scoring – Final Score Penalties

- Scrambler or Items Not Impounded: 5000 points added to the team's Final Score.

Building Ideas



Construction Tips - Stopping

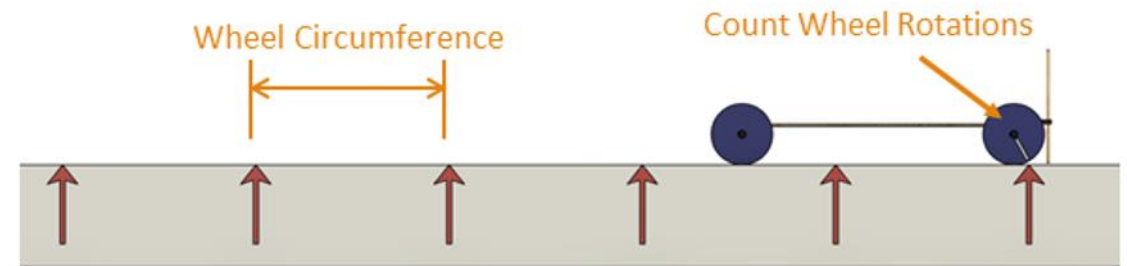
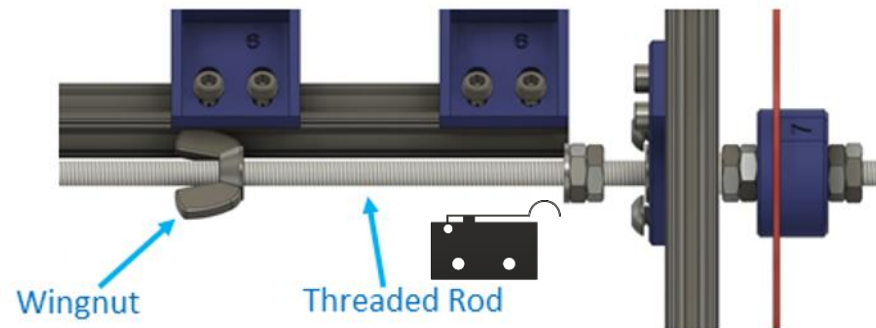
The prayer method – Please let it stop where it is supposed to.

or

An axle and wing nut can still do the job. BUT...

The wing nut must start at a point, move away from the stopper nuts, then move back toward the stopper nuts to stop the vehicle.

- The students will have to experiment to find the proper starting point.
- Here is where the Practice Log helps make a winner.





2023 General Vehicle Lessons & Tips



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https://youtu.be/aUo6u97BxqA?si=5-n1ojblqQuc3C0_

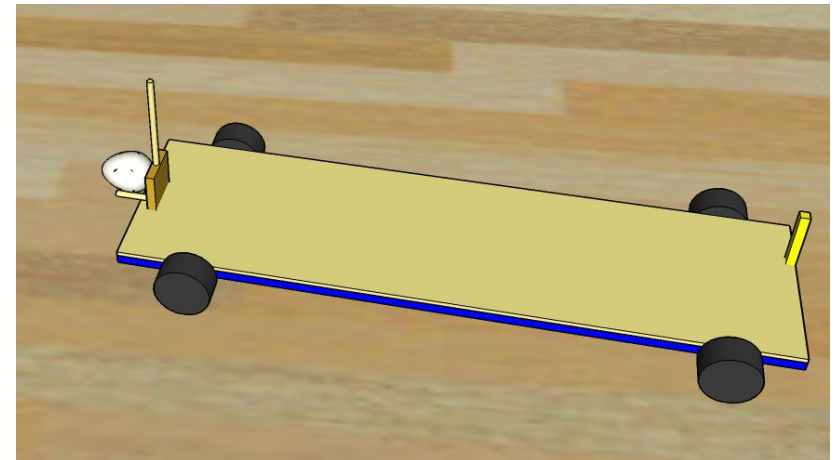
Construction Tips – Chassis Materials

- Carbon fiber tubes
 - Arrows commonly found in the sports department at stores.
 - Sort among them, the cheap ones do just as well as the expensive ones.
 - When they are cut to size, be careful of splinters, they travel.
- Extruded aluminum
 - Easy to use but can be more expensive
 - More under resources
- Wood, balsa or other
 - Not very expensive
 - Can be hard to make adjustments

Vehicle - Lightweight

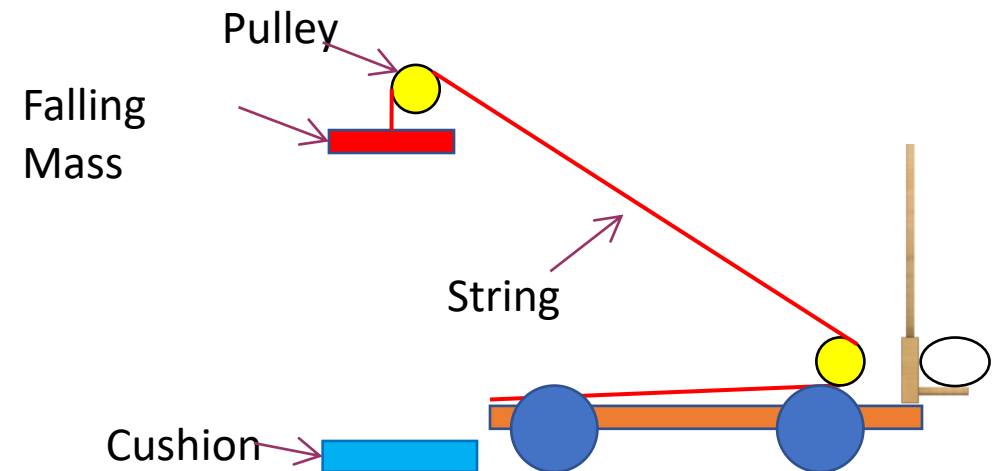
- Limited Potential Energy
- Heavy vehicles consume more energy to accelerate
- Heavy vehicle have more energy to impact the Terminal Barrier

$$PE = mgh$$
$$g = 9.8 \text{ m/s}^2$$



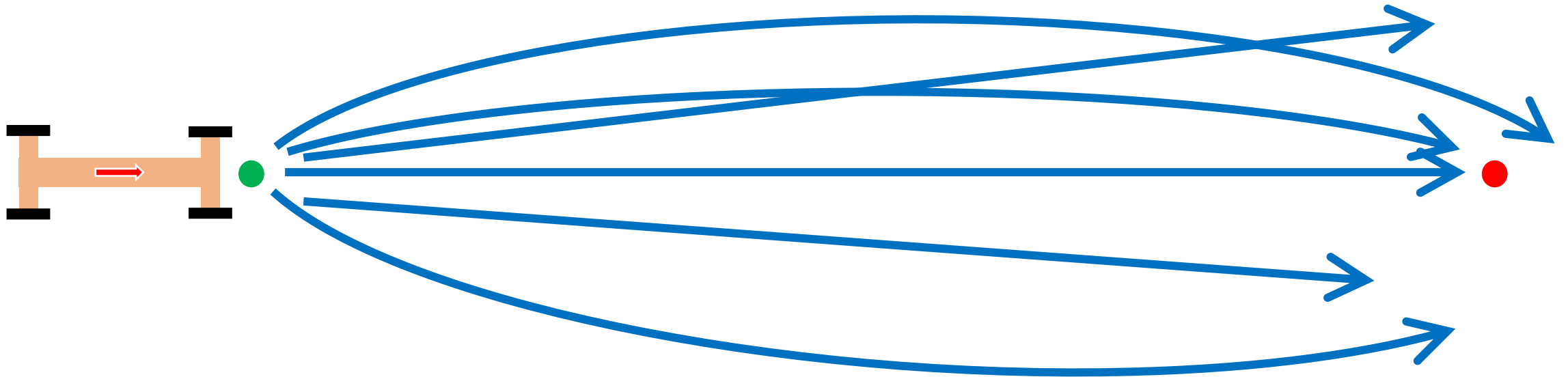
Construction Tips – Falling Mass

- Find a design that gives the maximum Fall Distance
- Do not push the limits of dimension or weight
 - Different scales will have differences in measured values
- Create a design that prevents the Falling Mass from contacting the floor. **Unlucky Bounce!!!**



Example only and not a required design

Steering vs Aiming – Do Not Confuse



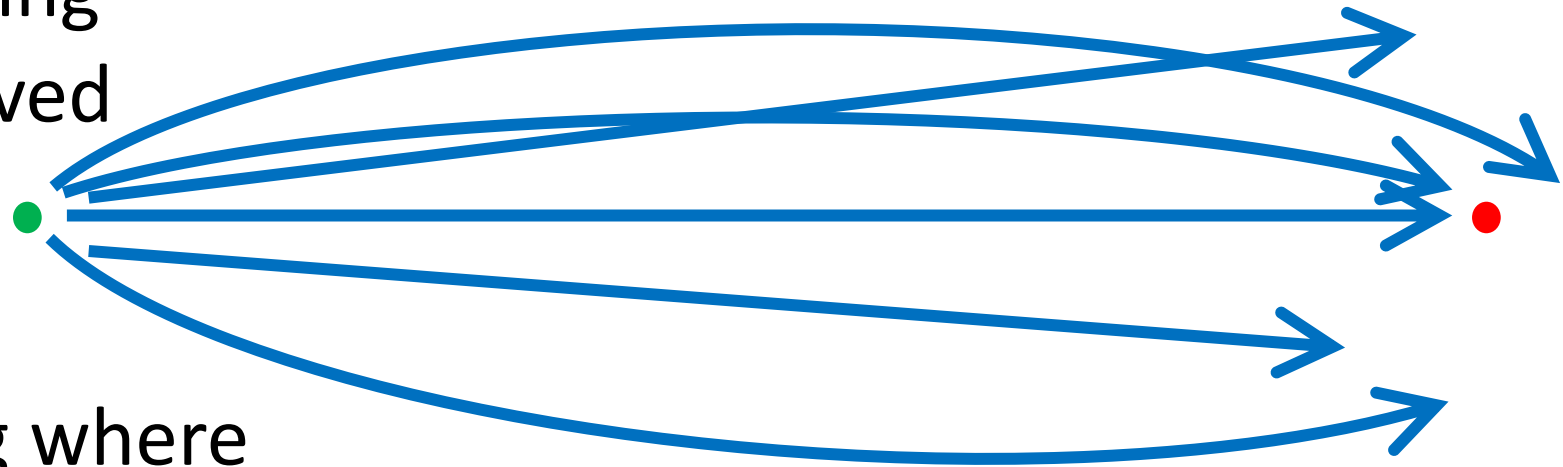
Steering vs Aiming

- **Steering**

- Controls how the vehicle travels while moving
 - Straight or Curved

- **Aiming**

- Part of controlling where the vehicle stops

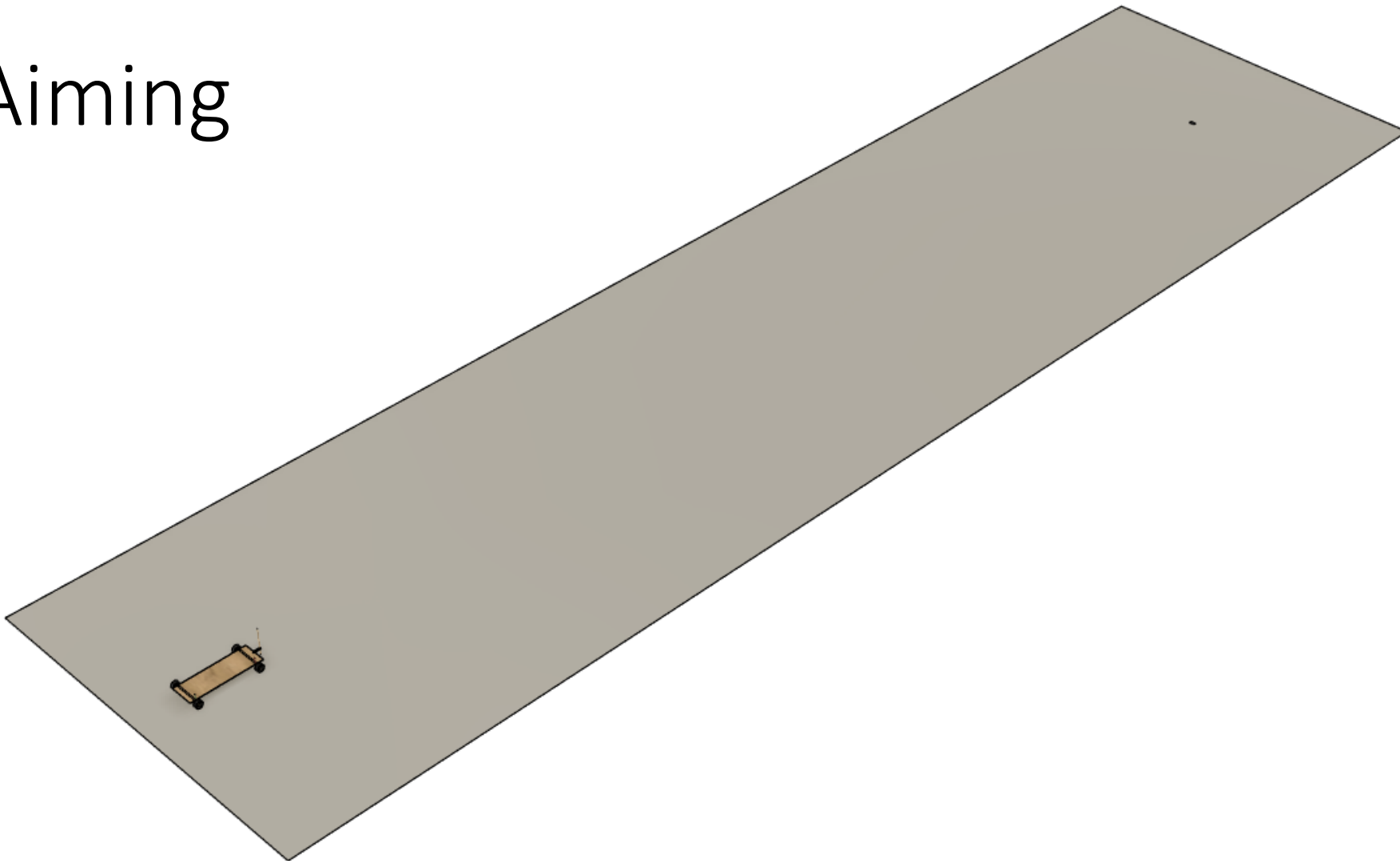


Steering Video

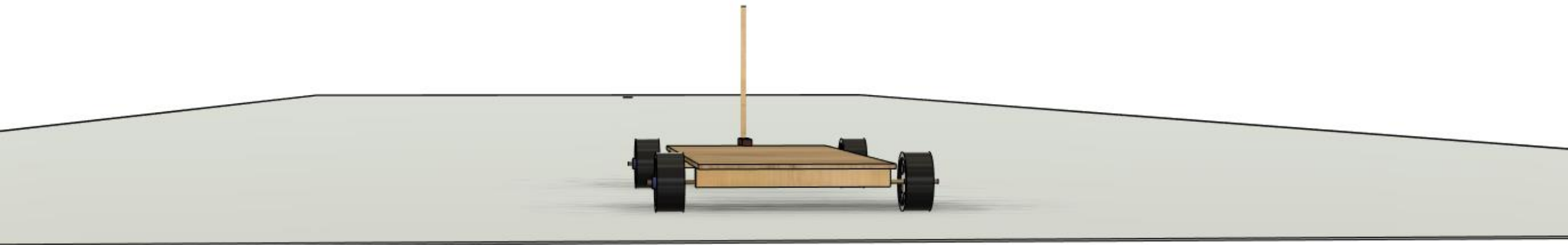


<https://youtu.be/LFXPmVsg71Q?si=Y4byN6hSKCbDTNOb>

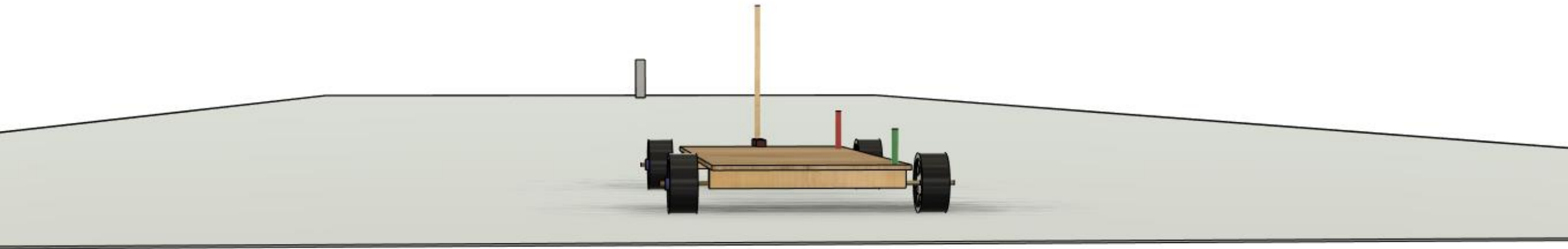
Aiming

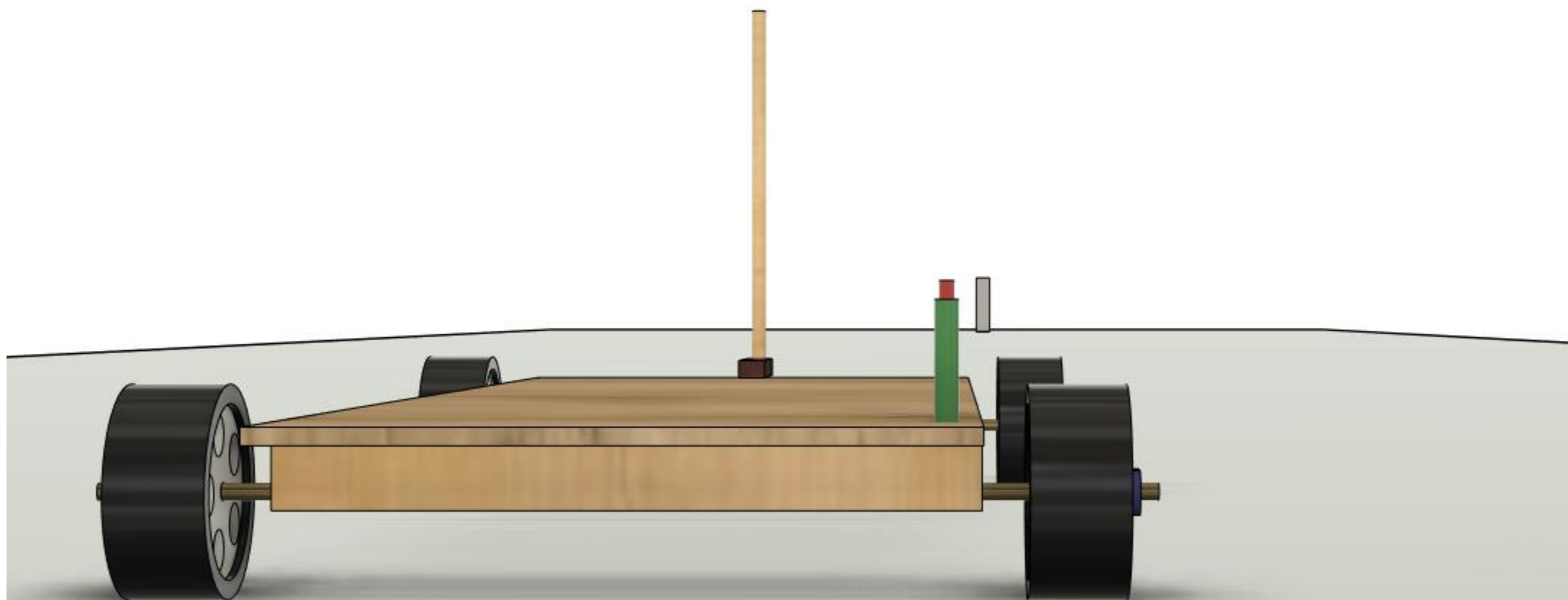


Aiming



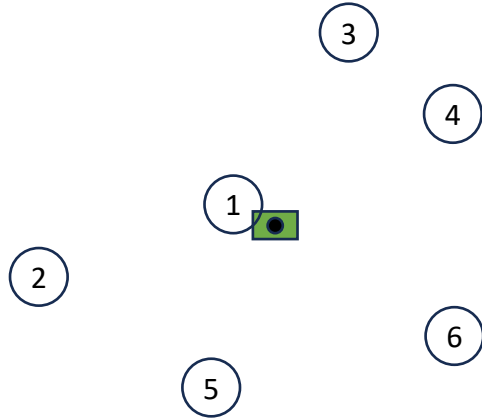
Aiming



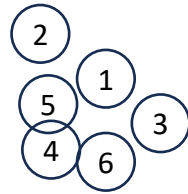


How are my Students Performing???

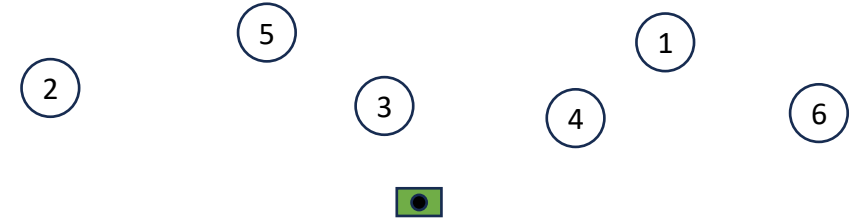
- Run the Vehicle several times with no changes between runs
- Mark the floor after each run



Team #1

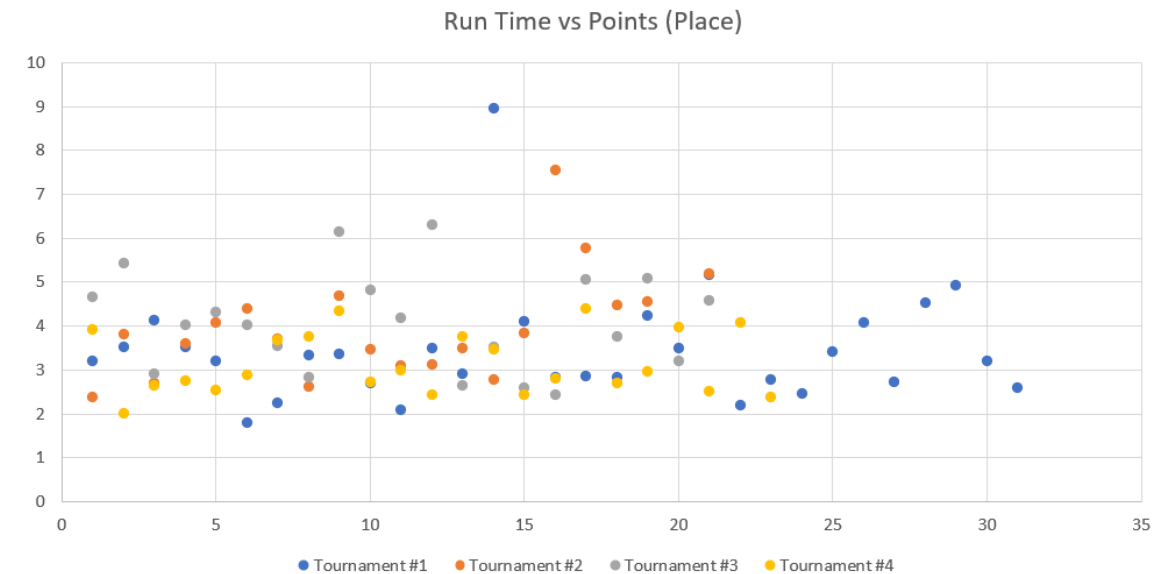
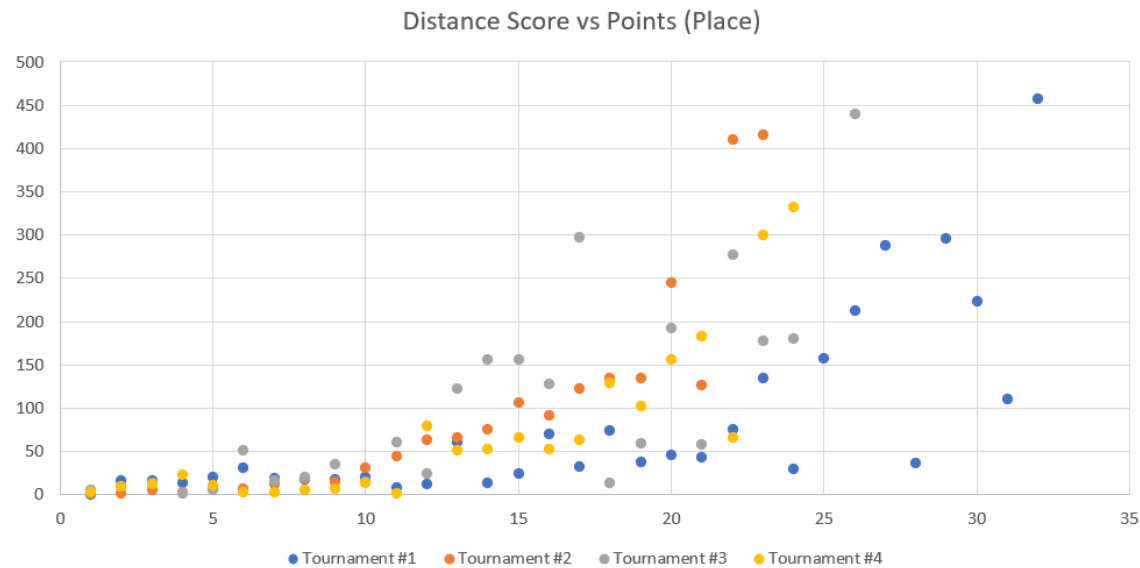


Team #2



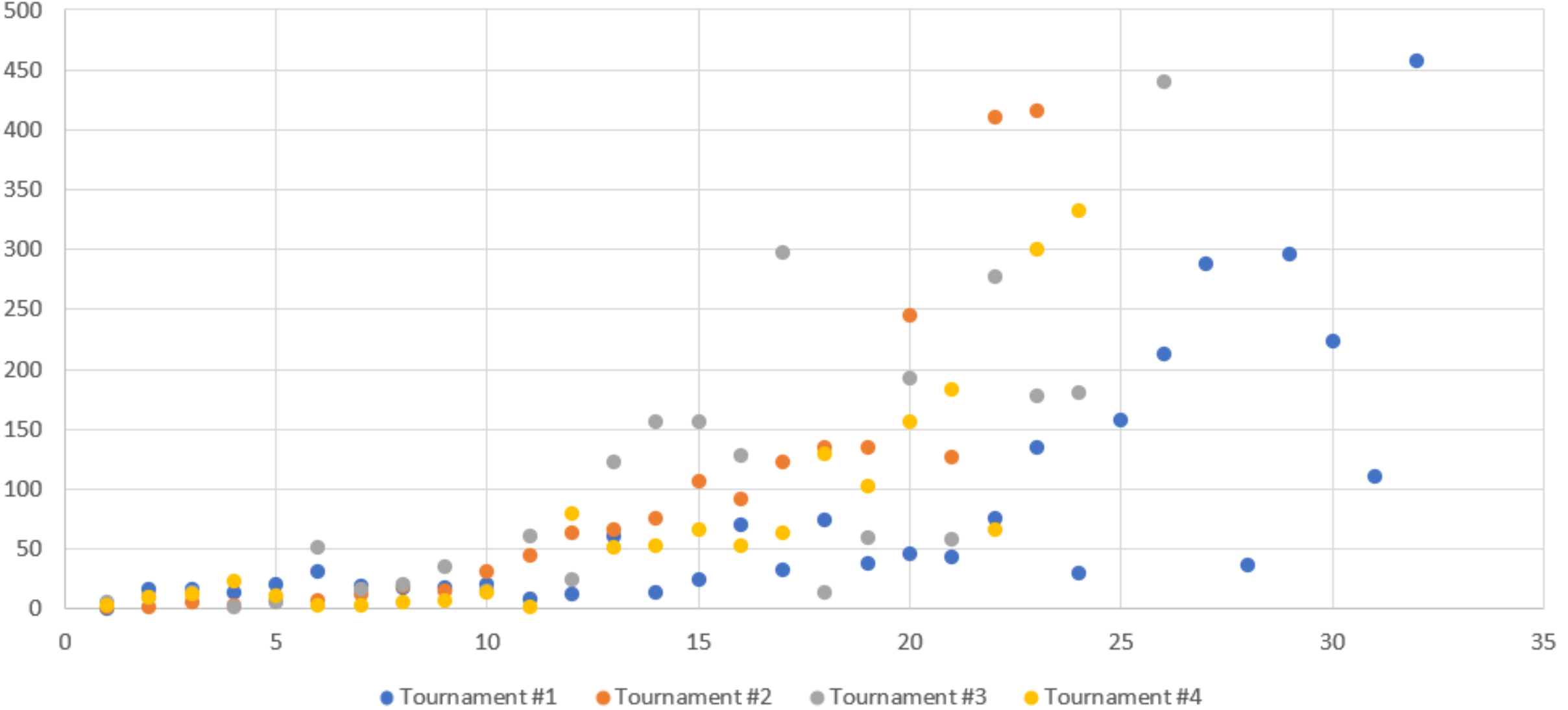
Team #3

Distance vs Time



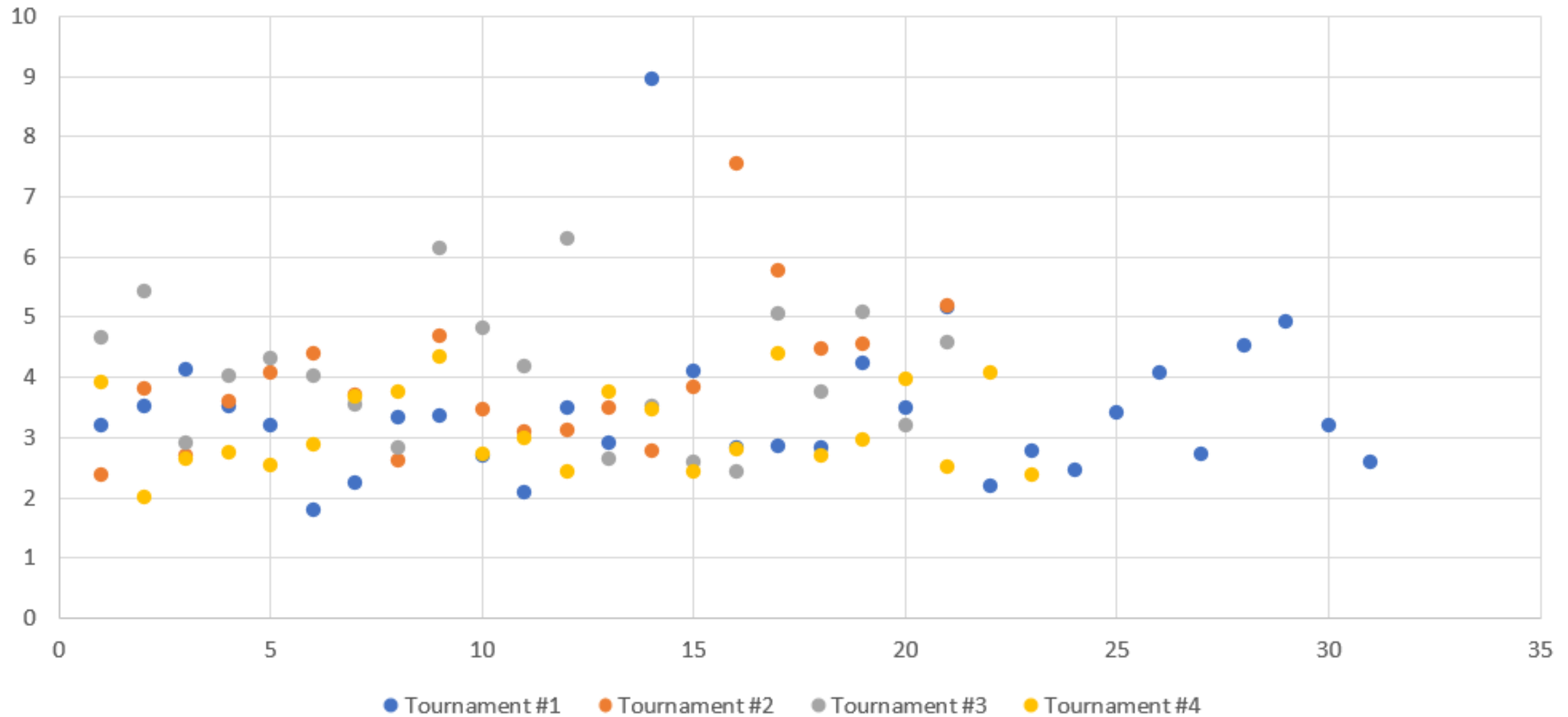
Wheeled Vehicle Scores 2024 (Last Year)

Distance Score vs Points (Place)



Wheeled Vehicle Scores 2024 (Last Year)

Run Time vs Points (Place)



Wheeled Vehicle Scores 2024 (Last Year)

Construction Tips

- www.TopFinishKits.com
 - Lists individual components and sites to purchase individual components
- www.scioly.com
 - Unofficial tips and suggestions from students and coaches

Note: Be careful of purchased kits. Pros and Cons to all kits

Thank You and Good Luck

