



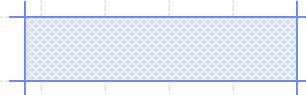
Scrambler!

CAUTION: Please remember that these PPT's . Check for updates in Rules manual.

Scrambler '25

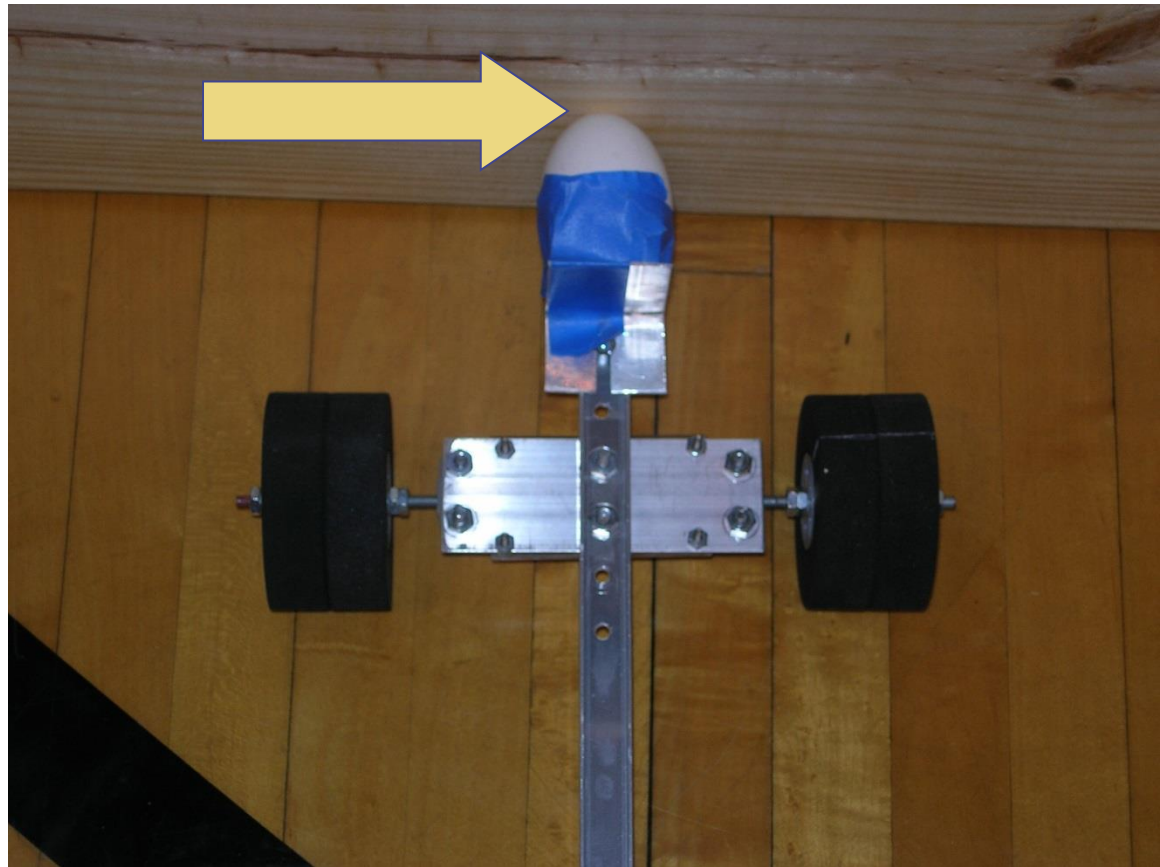


David Cambridge
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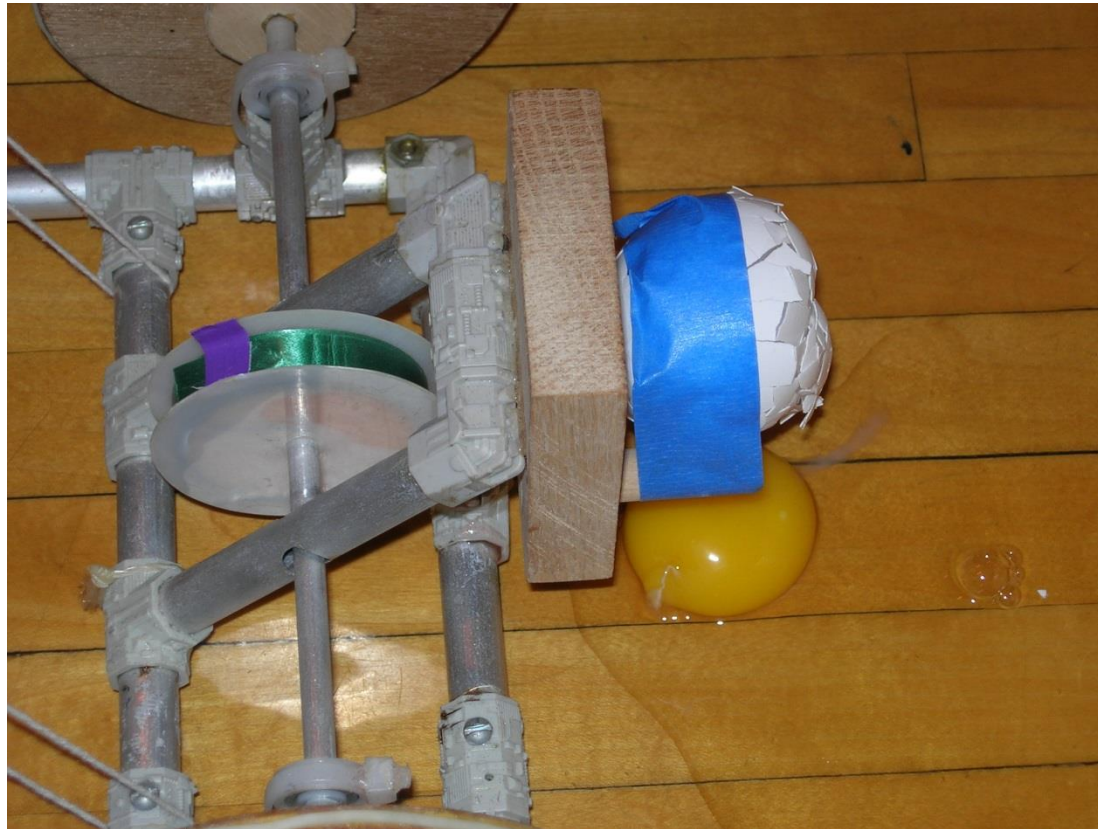


This is what you want it to do... as quickly as possible!!!

The intent is to have a falling mass propel a vehicle (ETV) carrying an egg down a track as quickly as possible and end up with the egg as close to the center of the terminal barrier without...



DOING THIS!!!



**Now you know why it is called SCRAMBLER....
or in this case SUNNY SIDE UPPER!!**

Scrambler 2025

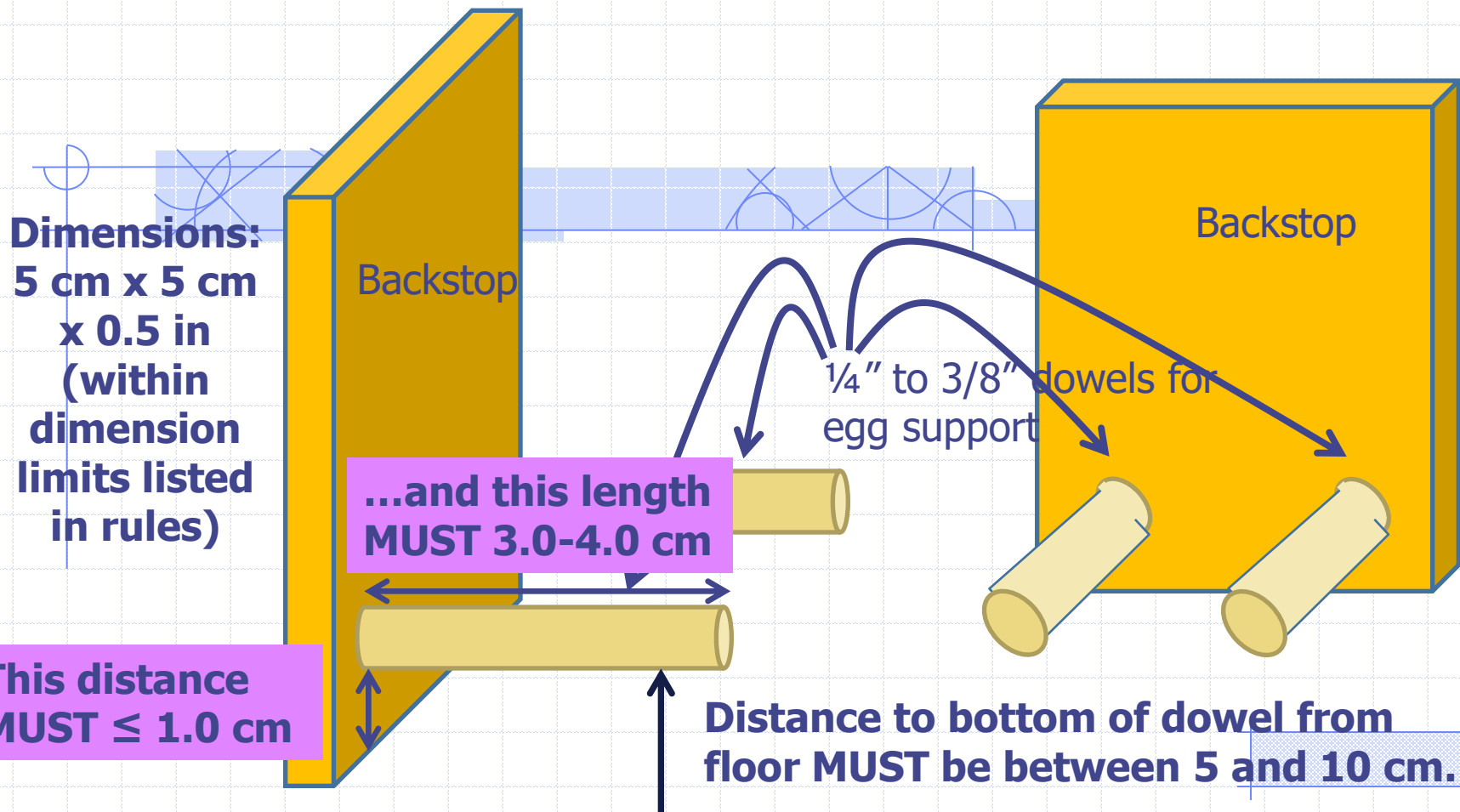
YouTube Views

- ☀ [Scrambler DVD 2015 Preview](#)
- ☀ [Nat Champ Run 2015 \(9.8 m\)](#)
- ☀ [2014](#)
- ☀ [2009](#)
- ☀ [2008](#)

**A number of things have
changed (as always), so
let's get cracking!**

Construction

- ✱ **Entire device – Must fit in a “box” 100 cm x 50 cm x 100 cm height when ready to run**
- ✱ **Could be 1 or 2 parts**
- ✱ **ALL energy from a falling mass – 2.0 kg max**
 - ‡ **Mass must NOT contact floor at ANY time**
- ✱ **Must start with a #2 pencil**
 - ‡ **May be the release mechanism**
- ✱ **Stopping mechanism built in**
- ✱ **No electricity/electronics**
- ✱ **Egg: large, grade A**
 - ‡ **Provided by event supervisor**
 - ‡ **Foremost part of vehicle**
 - ‡ **Taped to the following.....**



Construction

- ☀ **Practice Log (optional): At least 10 practice runs must be recorded with at least 4 parameters**

1. Target Distance
2. Distance from target
3. Time
4. Any additional parameter(s)

- ☀ **Also need a Design Log**

1. Materials used
2. Labeled diagram or picture
3. Information on any 3d printed parts

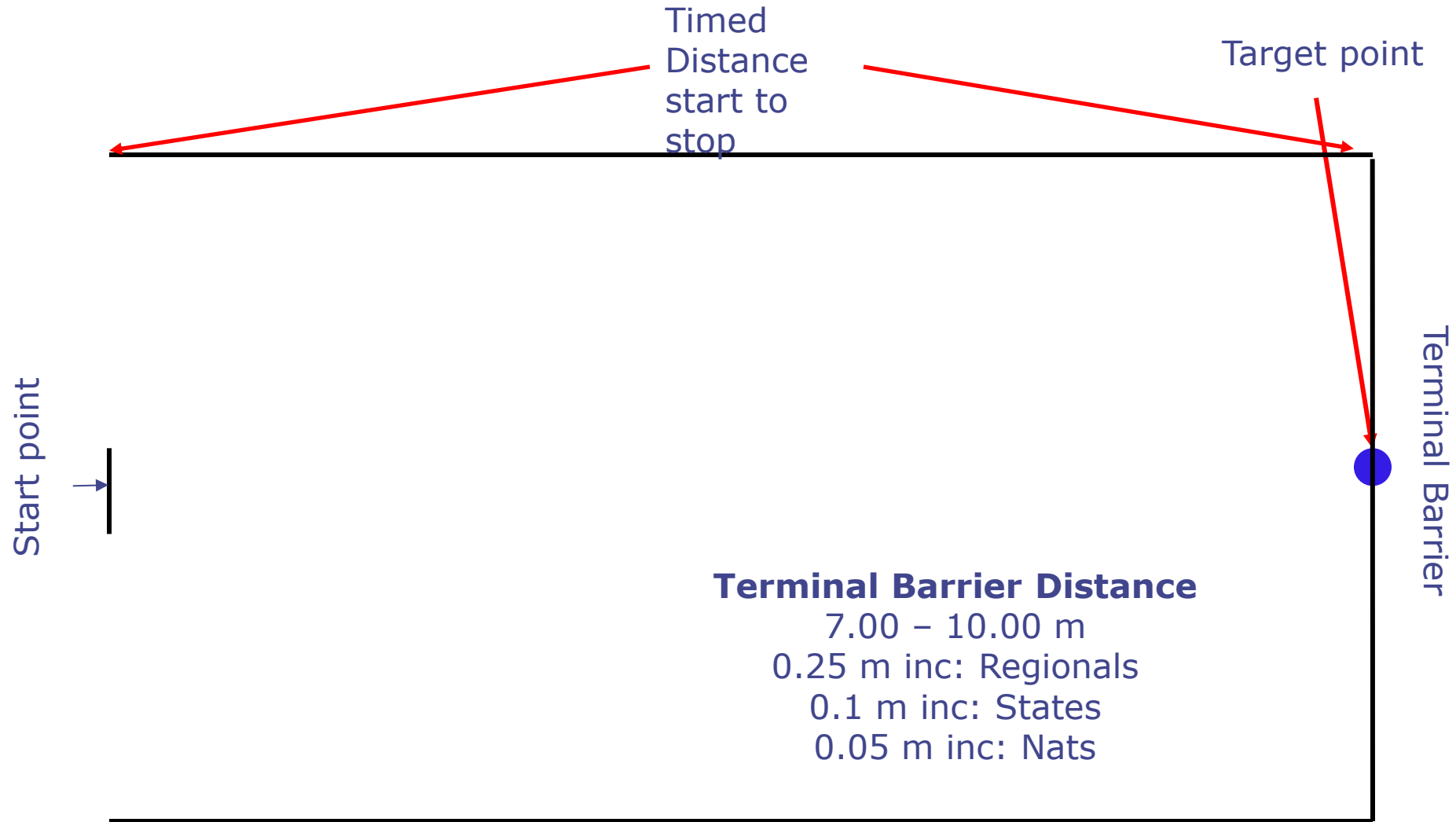
No Design log
required this
year!

- ☀ **Labels, units, cover sheet with Team info**

‡ **MUST BE IMPOUNDED**

**Caution: This diagram
is NOT in proportion.**

The Track



Competition

☀ **IMPOUND:**

- ‡ **Scrambler (with ALL falling masses completely detached)**
- ‡ **Practice Log (optional)**
- ‡ **Materials needed to repair/alter device**
 - **Examples: duct tape, alternate wheels, 1/4" dowel, etc...**
- ‡ **Tools, test data, calculating devices not NOT be Impounded.**

☀ **No outside assistance after competitors enter the event area.**

Competition

- ✱ **8 min. to start 2 runs**
- ✱ **Once weighed, mass must stay the same**
- ✱ **Pointed tip of egg MUST start on the Start Point**
- ✱ **Start with unsharpened #2 pencil**
- ✱ **2nd egg allowed IF 1st is broken prior to the first run!**
- ✱ **Egg taped to carrier, no tape on front or back 1cm**
- ✱ **Only parts of the Scrambler touching the floor at the start can contact the floor at any time during the run**
 - ✱ **Wheels need to be touching the floor!**

Scoring

- ☀ **Distance Score:** Distance from the pointed end of egg to centerline of the terminal barrier (to 0.1 cm) times 2
- ☀ **Run Time:** Run Time is the from the time it begins moving to the time it stops
 - ‡ Fastest time likely to be ~3 seconds
- ☀ **Run Score = Distance Score x 2 + Run Time + Penalties**
- ☀ **Final Score is whichever run gives you the better ranking**
- ☀ **Tiebreakers**

Penalties

- ✱ **Missing impound: 5000 pts.**
- ✱ **Failed runs get 2500 as distance score**
- ✱ **Competition Violations: 150 pts for each**
- ✱ **Construction Violations: 300 pts for each**

Competition Penalties

(150 pts/each)

- ☀ Egg broken
- ☀ ANY part of egg transport contacts wall before egg does
- ☀ Competitor follows ETV down track
- ☀ Etc.

Penalties (cont.)

- ✱ **Construction penalties (300 pts/violation)**
 - ‡ Any dimension violation
 - ‡ Mass cannot stay at height by itself or without the supplied pencil incorporated into the device
 - ‡ Any violation of Egg Holder counts as 1 construction penalty
 - ‡ Piece detaches and contacts floor
 - ‡ Etc.
- ✱ **Failed Runs: Anytime run can't be timed or distance measured**
 - ‡ Starts before ES is ready
 - ‡ ETV picked up before ES can measure
 - ‡ ETV passes TB
 - ‡ Egg broken on first run, second is failed

Scoring Example

☀ First Run

- ‡ Distance Score was 18.5 cm from center of TB
- ‡ Run Time of 2.5 seconds
- ‡ No penalties
- ‡ **Run #1 Score = $(18.5 * 2) + 2.5 + 0 = 39.5$**

☀ Second Run

- ‡ Distance Measurement was 5.2 cm from center of TB
- ‡ Run Time of 2.3 seconds
- ‡ Competition violation penalty - Broke egg by contact with TB - 150 points
- ‡ **Run #2 Score = $(5.2 * 2) + 2.3 + 150 = 162.7$**

☀ **Final Score = 39.5**

Rule Clarification

Scrambler B: 10/15/24

This rule correction removes conflicting language from rule 2.c.

Original rule:

2.c. Teams may bring data and a stand alone calculator (Class III) of any type along with non-electronic tools which do not need to be impounded.

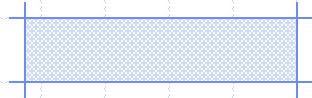
Corrected rule:

2.c. Teams may bring a stand alone calculator (Class III) of any type along with non-electronic tools which do not need to be impounded.

Building suggestions

- ✱ **First and foremost, build early, practice, log, and calibrate as many runs as possible.**
- ✱ **Practice with a plastic egg filled with any material to around 57-60 g**
- ✱ **Always build just under/over the dimensions!!!!**
- ✱ **Make the ETV as light as possible**
- ✱ **Perhaps try some different floor surfaces**
- ✱ **Did I say calibrate?**
- ✱ **Strongly consider using aligning devices since you need the ETV to go as straight as possible**

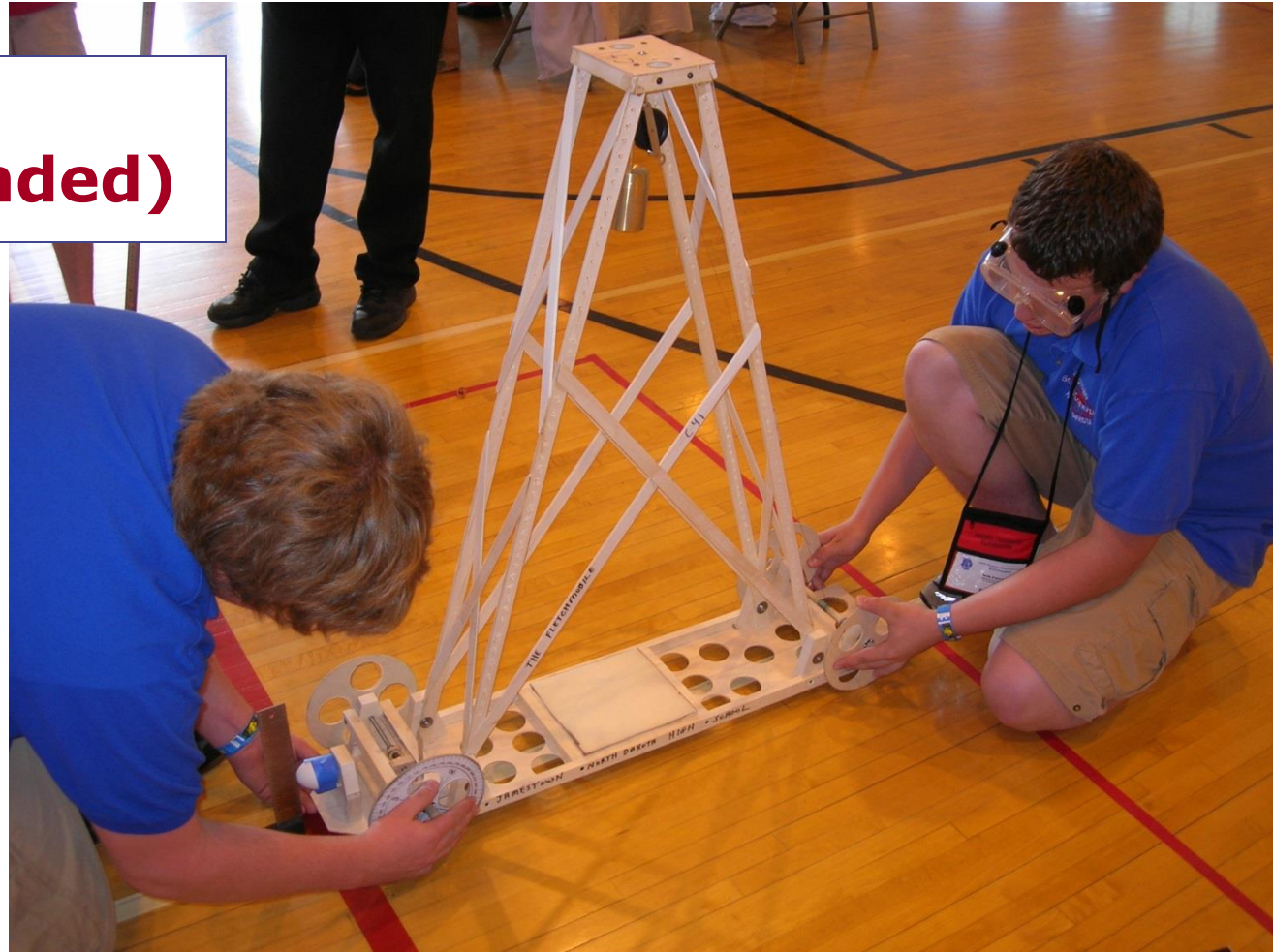
PROPULSION SYSTEMS



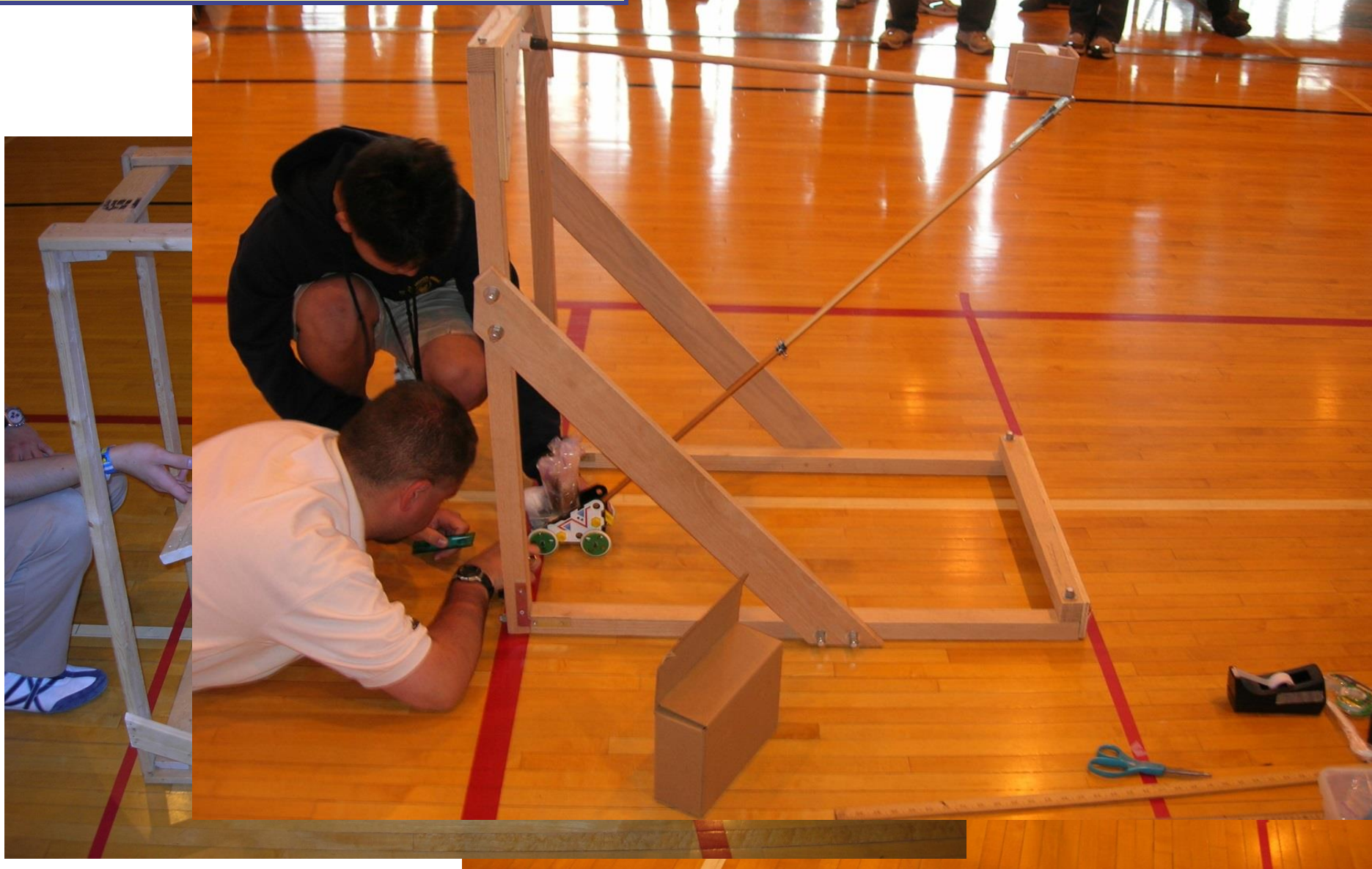
Single (combined units)



(Not recommended)



Separate units: Mass-push

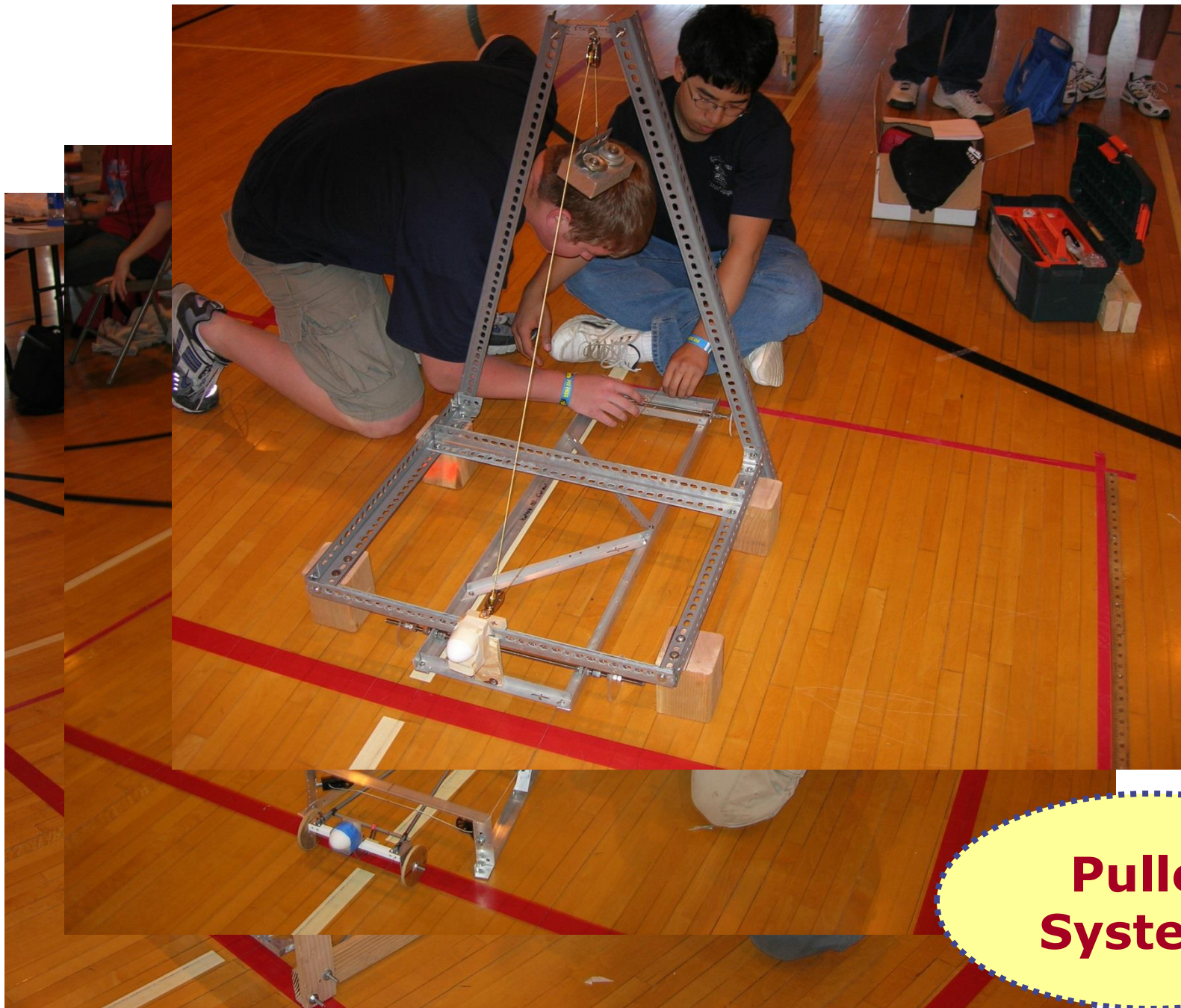


Pulley Systems

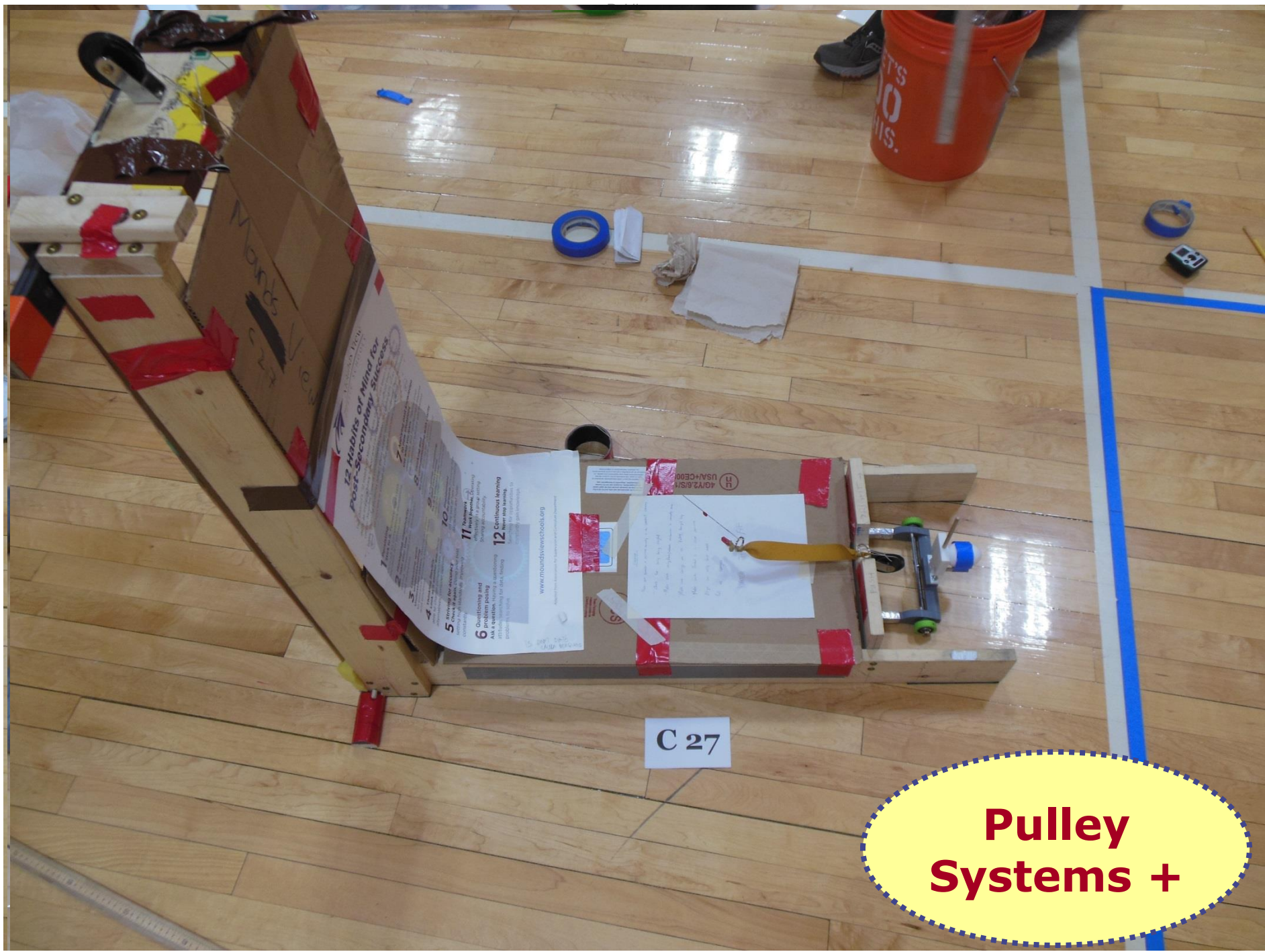
Public

'25





Pulley Systems

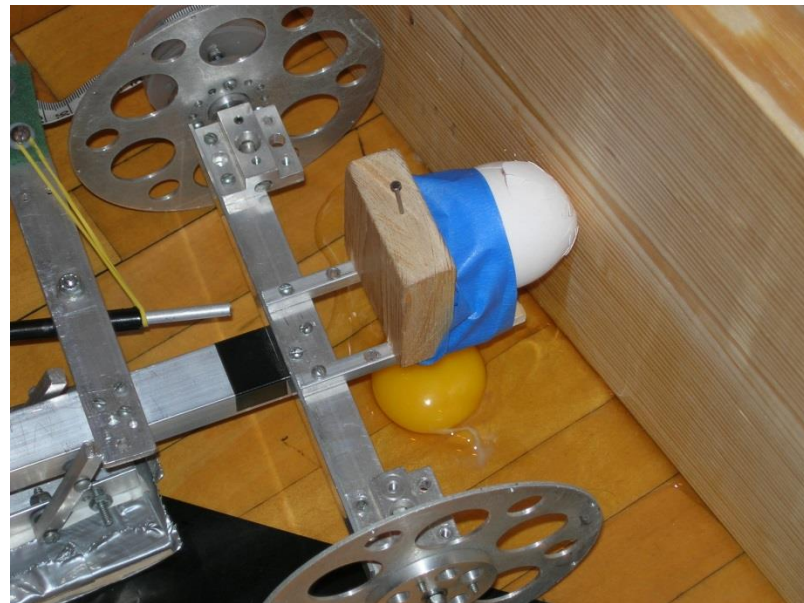


C 27

**Pulley
Systems +**

Braking Systems

- ☀ Prayer
- ☀ Axle and String
- ☀ Axle and Wing Nut
 - ‡ By far the most common
 - ‡ Wheel revolution
 - ‡ [Example](#)
- ☀ Miscellaneous



The End