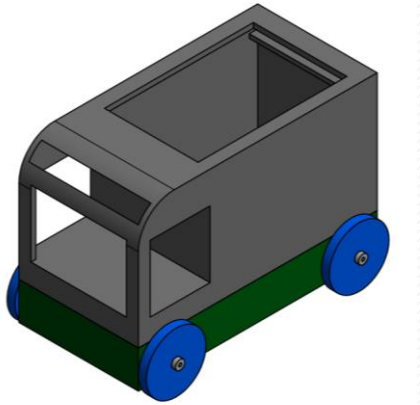
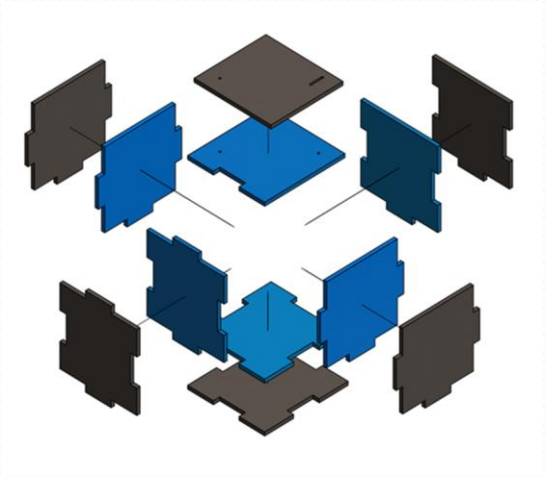
Ridgewood Engineering

Ridgewood Engineering

1. Union Ridge Design and Modeling class
2. Foundations of Technology
   - Dual credit starting 2018/2019
3. Camp GADgET (Girls Adventuring in Design, Engineering & Technology)





Foundations of Technology

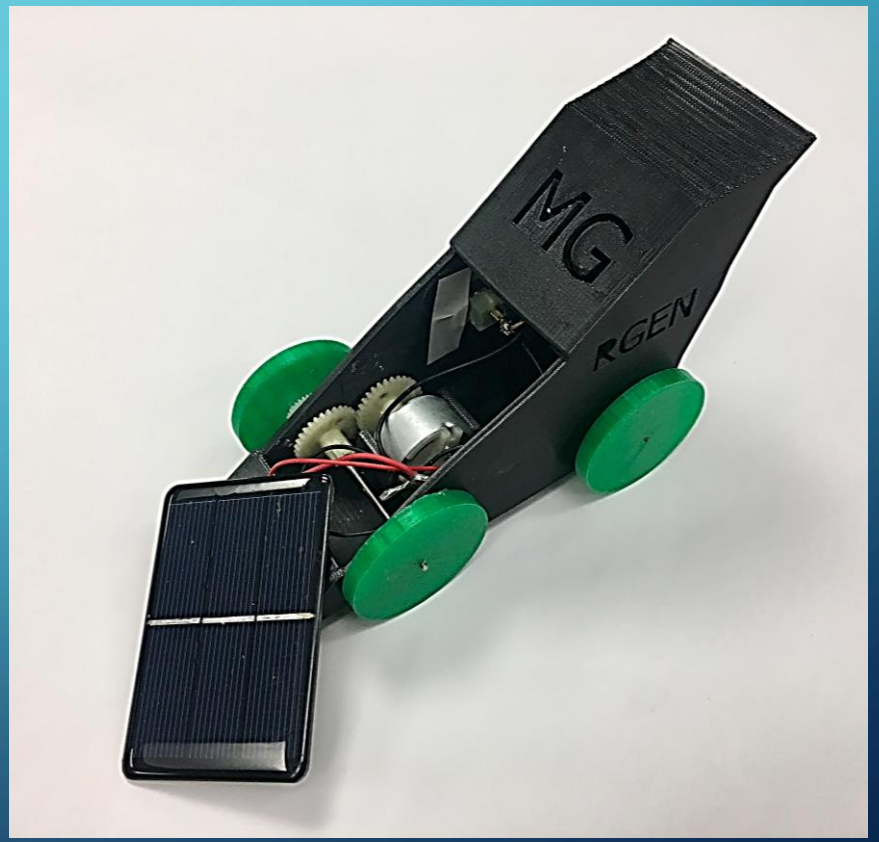
Derek Cappaert
Engineering Teacher

TOY SOLAR CAR

ANNA GUBAS & ADAM KLOPOTOWSKI

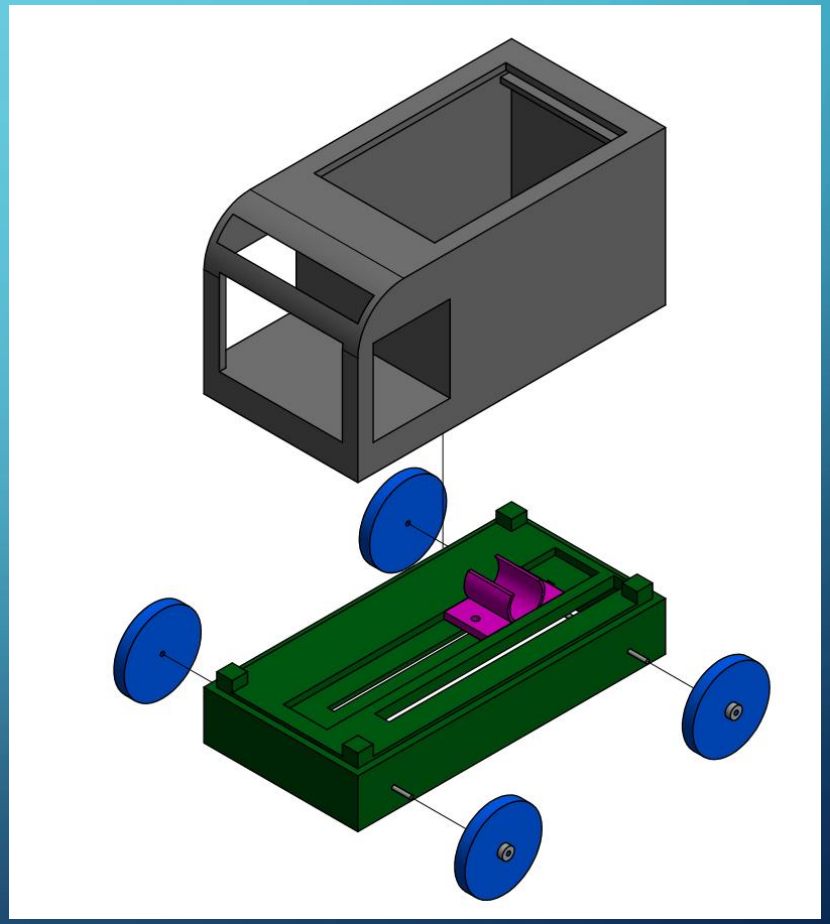
1ST GENERATION TOY SOLAR CAR

- Bad gear ratio
  - Low torque
  - Cannot change gear ratio
- High friction gears
- Low traction wheels
- Crooked wheels
- Difficult to work on motor

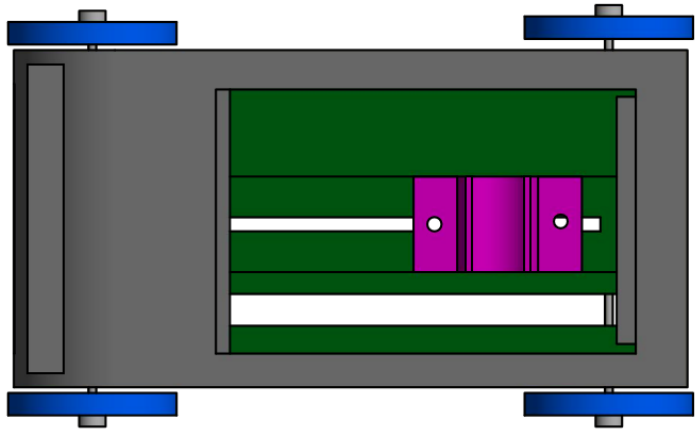


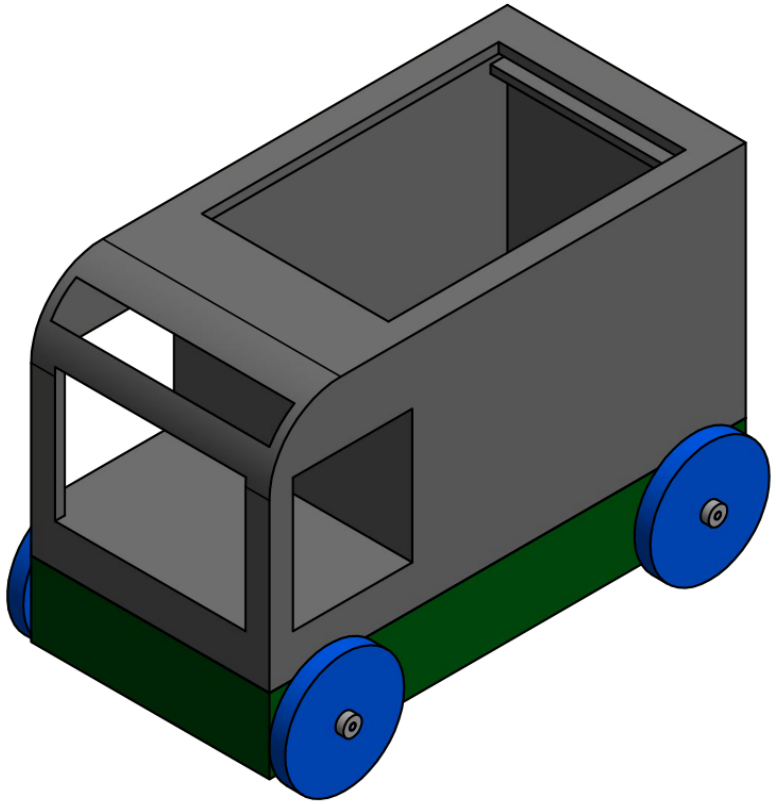
2ND GENERATION TOY SOLAR CAR

- Can easily change gear ratio
  - Motor slides on track
- Belt drive lowers friction
  - Rubber band belt
  - Pulley attached
- Increased wheel traction
- Straighter wheels
- Easy to work on motor



2ND GENERATION SOLAR CAR





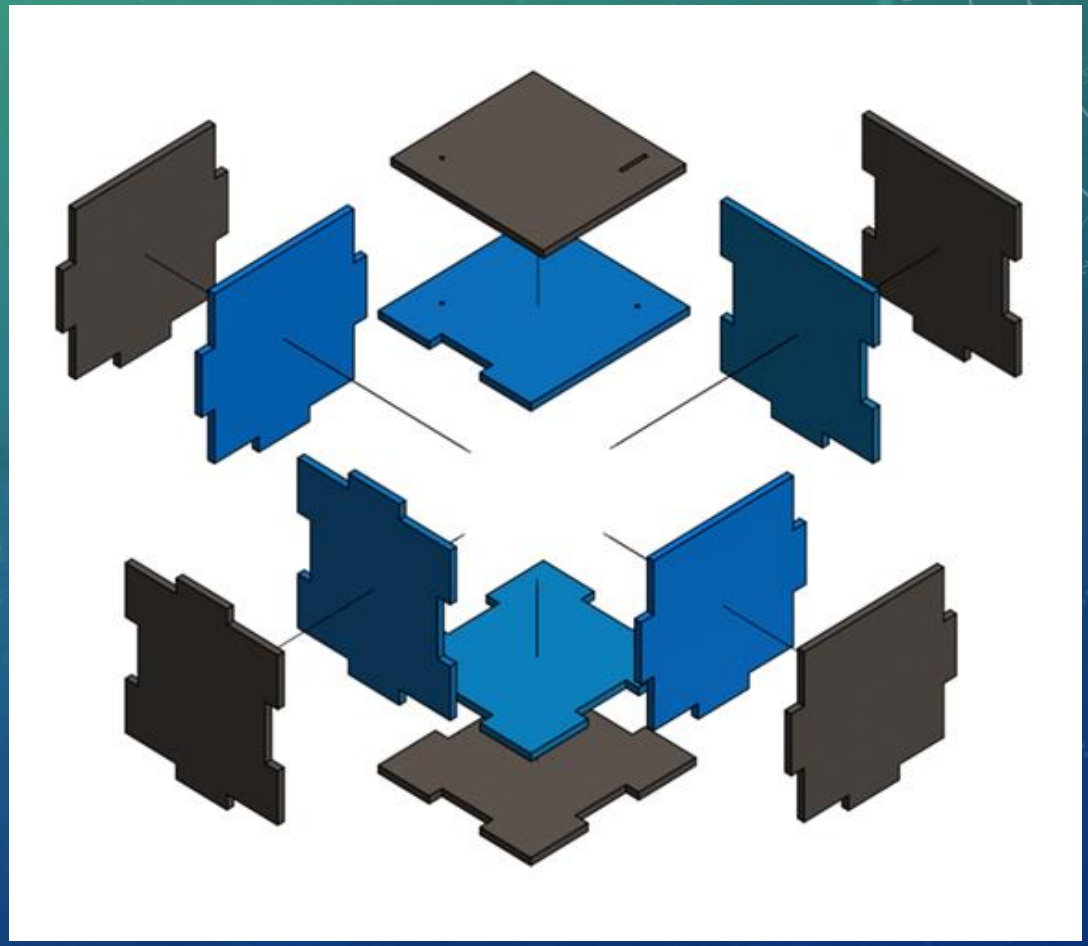
NEXT PROJECT

UNABOX

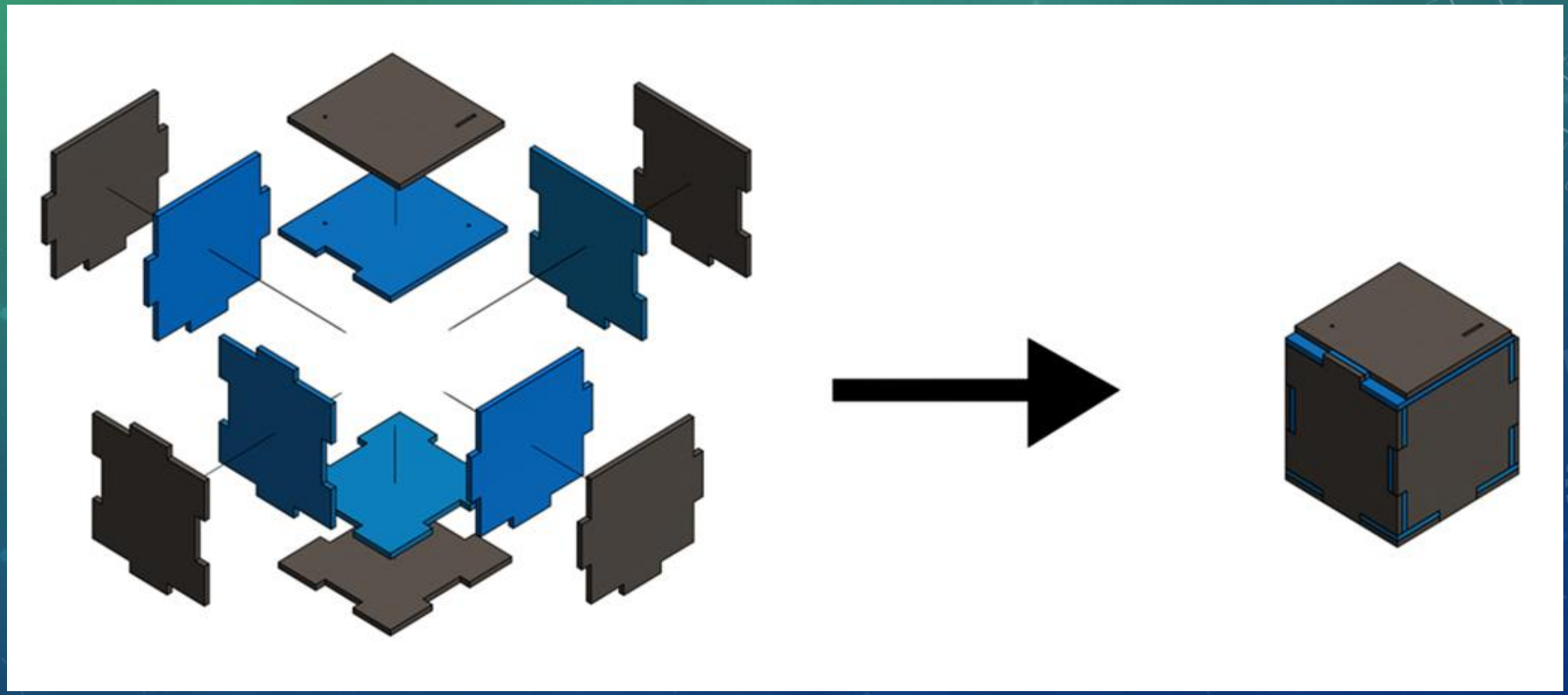
HAILEE POLASKI

UNABOX

- I chose to create a Unabox
- I learned how to use Inventer
  - Modeled parts
  - Created an assembly
  - Improved spatial skills
- 3D print blue parts
- Laser cut wood parts



UNABOX

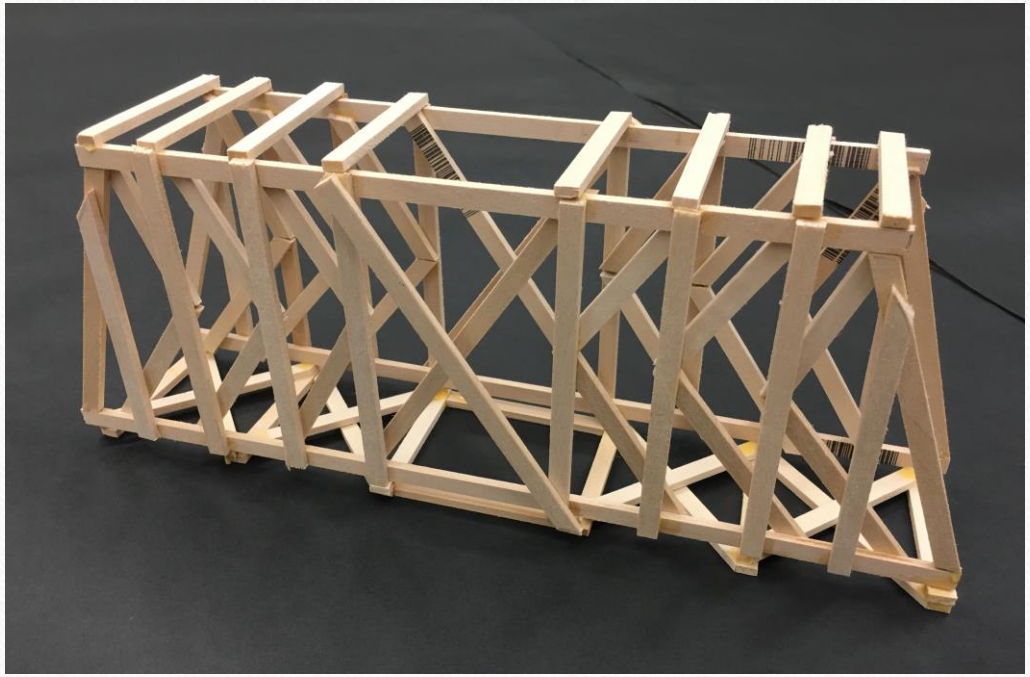


Basswood Truss Bridge

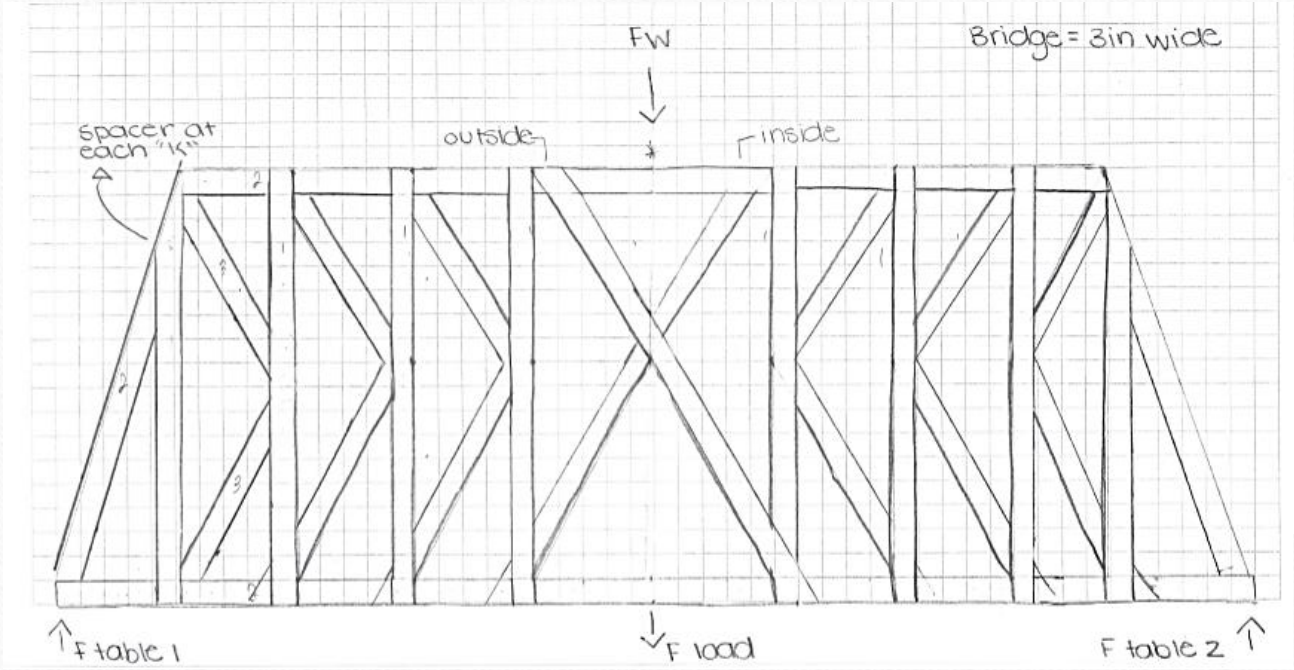
Caitlyn Adams

Basswood Truss Bridge

- Multiview sketches
- Shape influences strength
- Gained construction skills
- Studied forces on bridges



Basswood Truss Bridge



$+\uparrow \Sigma F_y = F_{Table\ 1} + F_{Table\ 2} - F_{Load} - F_w = 0\,lb$

$F_{Table\ 1} + F_{Table\ 2} - F_{Load} - 0.141\,lb = 0\,lb$

We didn't test my bridge

$+\rightarrow \Sigma F_X = 0\,lb$

Use this equation to calculate the bridge supports.

Trebuchet Catapult

Johnathan Hernandez

Trebuchet Catapult

- Energy transfer
  - P.E. of counterweight to KE of marble
  - Energy lost to friction & air resistance
- Mechanical advantage
  - Projectile arm longer
  - Marble travels faster than C.W.

Projectile Analysis

Trial #	m_{proj}	$m_{empty\ cw}$ (kg)	$m_{pennies}$ (kg)	$m_{total\ cw}$ (kg)	Δhcw (cm)	Δh_{cw} (m)	PE_{cw} (J)	KE_{proj} (J)	v_i (m/s)	θ_{launch}	Radians	R_{ideal} (m)	R_{actual} (in)	R_{actual} (m)
1	0.005575	0.1	0.0000	0.1000	7.5	0.075	0.44	0.44	12.58	45.00	0.79	16.14	21	0.53
2	0.005575	0.1	0.0215	0.1215	7.5	0.075	0.46	0.46	12.80	45.00	0.79	16.72	37	0.94
3	0.005575	0.1	0.0405	0.1405	7.5	0.075	0.47	0.47	13.00	45.00	0.79	17.23	44	1.12
4	0.005575	0.1	0.0725	0.1725	7.5	0.075	0.49	0.49	13.32	45.00	0.79	18.09	51	1.30
5	0.005575	0.1	0.0955	0.1955	7.5	0.075	0.51	0.51	13.54	45.00	0.79	18.71	55	1.40
6	0.005575	0.1	0.1355	0.2355	7.5	0.075	0.54	0.54	13.93	45.00	0.79	19.79	59	1.50
7	0.005575	0.1	0.175	0.2750	7.5	0.075	0.57	0.57	14.30	45.00	0.79	20.85	65	1.65
8	0.005575	0.1	0.1892	0.2892	7.5	0.075	0.58	0.58	14.43	45.00	0.79	21.23	67	1.70
9	0.005575	0.1	0.195	0.2950	7.5	0.075	0.58	0.58	14.48	45.00	0.79	21.39	72	1.83
10	0.005575	0.1	0.2121	0.3121	7.5	0.075	0.60	0.60	14.63	45.00	0.79	21.85	70	1.78
11	0.005575	0.1	0.2215	0.3215	7.5	0.075	0.60	0.60	14.72	45.00	0.79	22.10	71	1.80
12	0.005575	0.1	0.2551	0.3551	7.5	0.075	0.63	0.63	15.02	45.00	0.79	23.01	73	1.85
13	0.005575	0.1	0.2751	0.3751	7.5	0.075	0.64	0.64	15.19	45.00	0.79	23.55	75	1.91
14	0.005575	0.1	0.2931	0.3931	7.5	0.075	0.66	0.66	15.35	45.00	0.79	24.03	75	1.91
15	0.005575	0.1	0.315	0.4150	7.5	0.075	0.67	0.67	15.53	45.00	0.79	24.62	77	1.96

Trebuchet Catapult