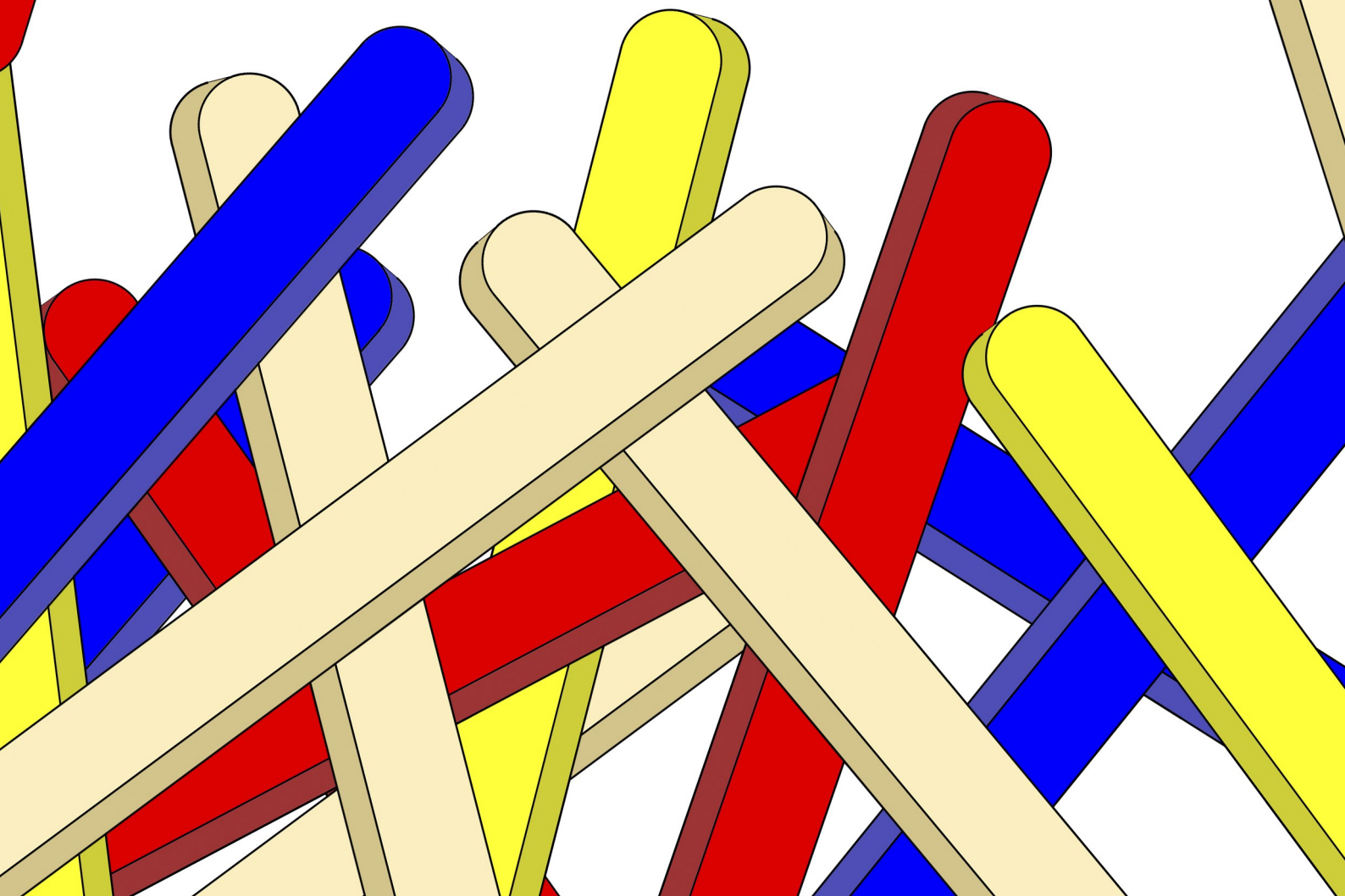
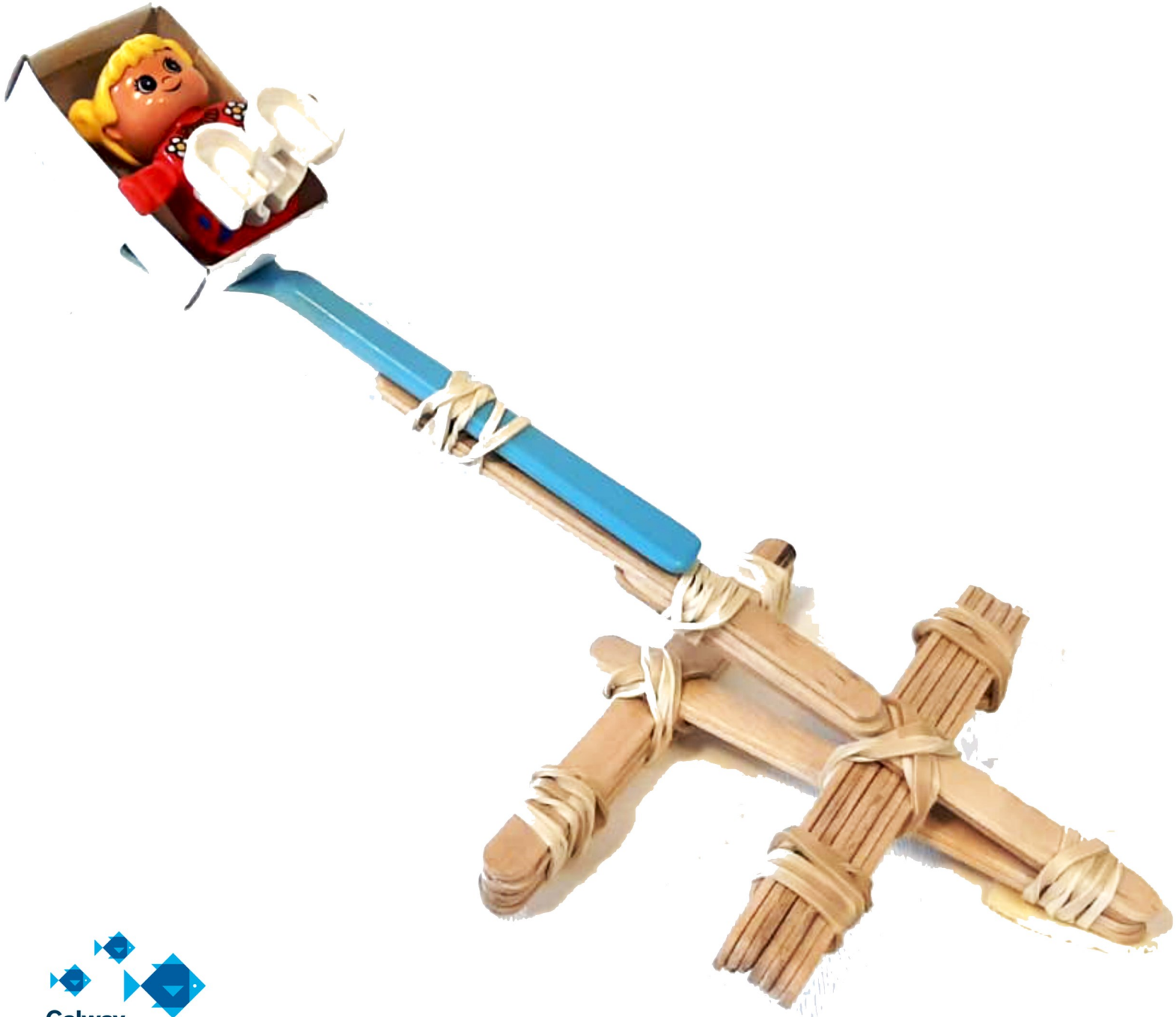
ENGINEERS WEEK 2021

Activity One

GALWAY BUILDS





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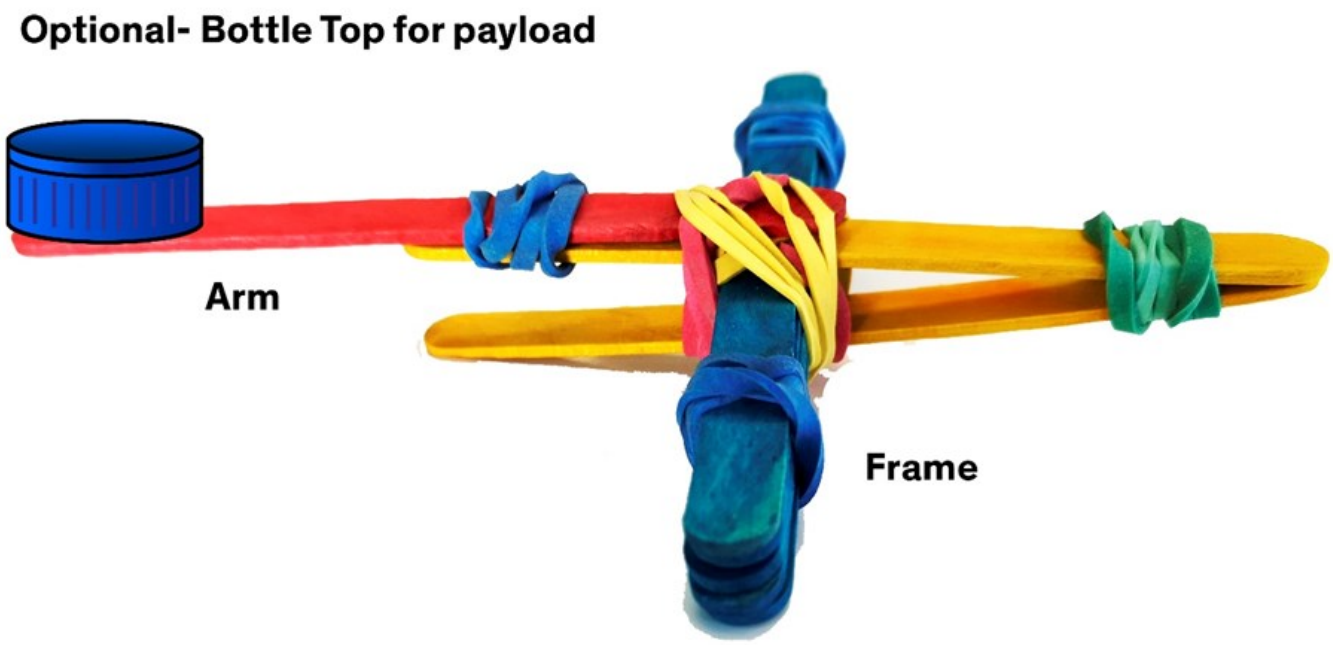
Galway Atlantaquaria

‘PRAWN TAIL KICKER’ Catapult



ENGINEERS WEEK ACTIVITY MAKING your own ‘Prawn Tail Kicker’ Catapult

INSTRUCTIONS

1. Make a stack of lollipop sticks and rubber band them together on each end.

2. Take two additional lollipop sticks and stack them together. Rubber band them together on just one end.

3. Pull the two sticks slightly apart and place the larger stack of lollipop sticks in between them.

4. Rubber band the stack of sticks to just the upper stick.

5. Rubber band a spoon or bottle cap to the upper lollipop stick.

6. Place an ‘object’ onto the spoon.

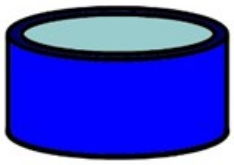
7. Hold the frame with one hand and use the other hand to pull the spoon down. Release the spoon to launch your object!

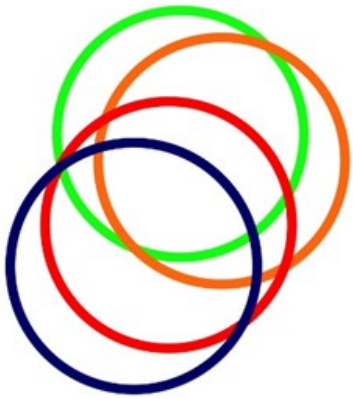
Watch the videos on our YouTube Channel, see; /GalwayAtlantaquaria

PRAWN TAIL KICKER

ITEMS LIST

1. A number of lollipop sticks
2. Rubber bands
3. Optional bottle cap
(for holding payload)
4. A object to launch

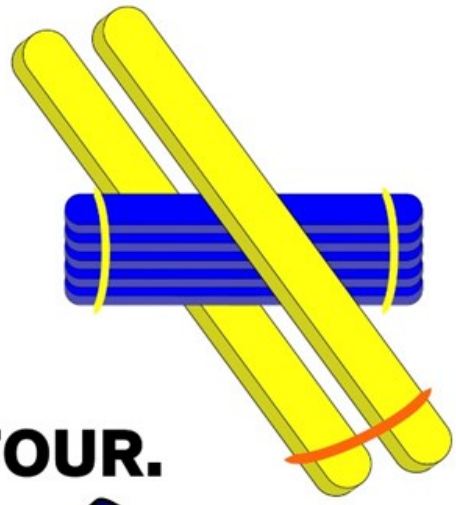




STEP ONE.

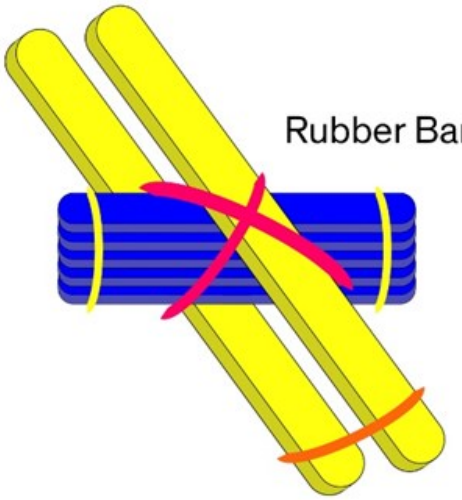
Rubber Band

STEP TWO.



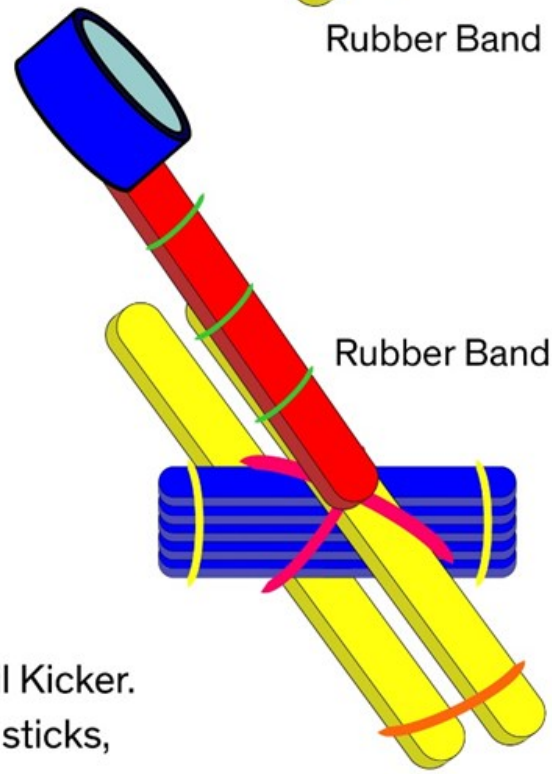
Rubber Band

STEP THREE.



Rubber Band

STEP FOUR.

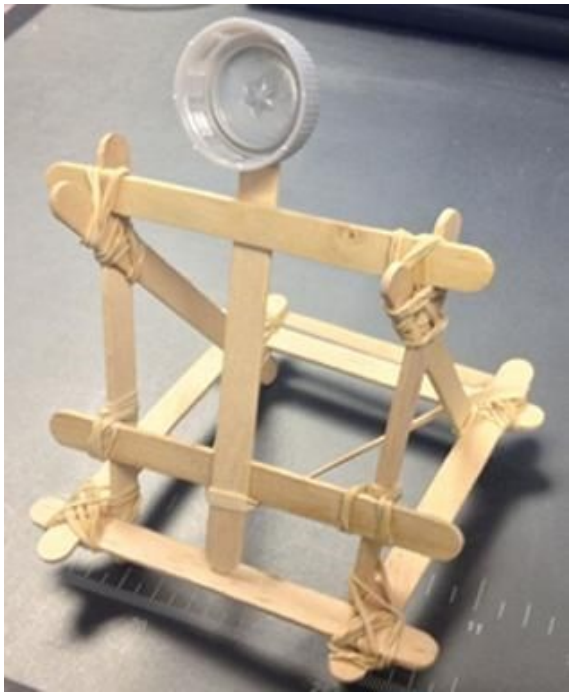


Rubber Band

Well done! You have built your first Prawn Tail Kicker. Now you can play with the design, add more sticks, try different designs. #engweek21 #iengineer

BE CREATIVE

Once you build your first 'Prawn Kicker', why not get creative and try these different designs?



Explore Physics and Ranging of the Prawn Tail Kicker

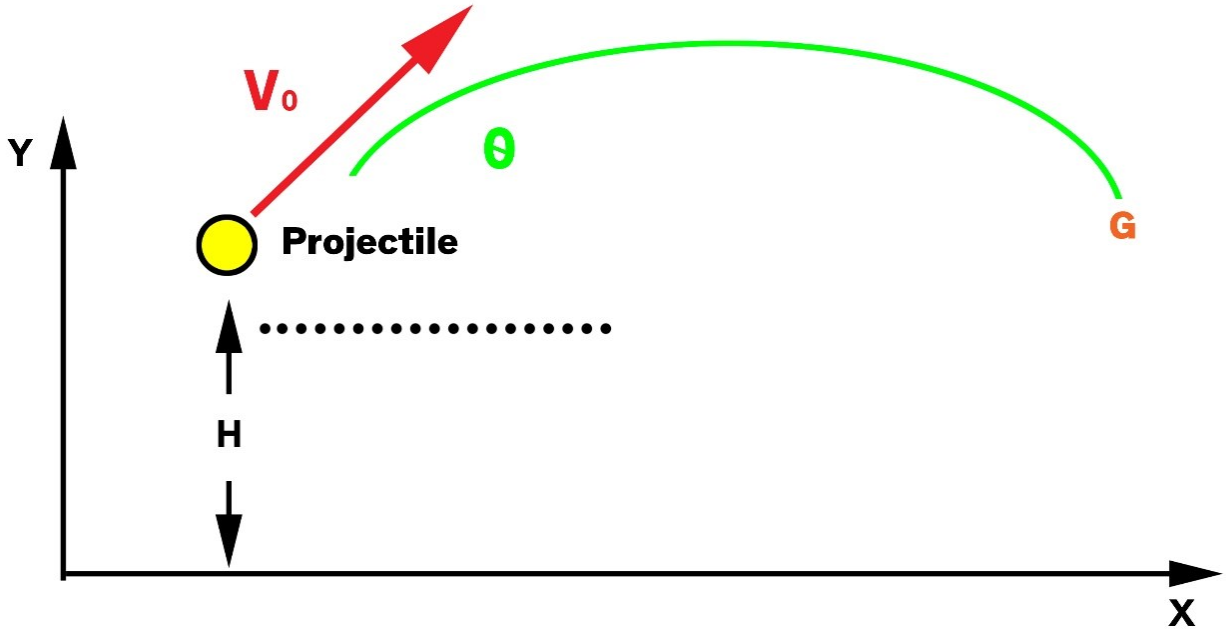


Figure 1. This graphic shows a typical setup for a projectile motion problem. A projectile at height h above the ground (y=0) is launched with an initial velocity v0 at an angle θ with respect to the horizontal (the x-axis). Gravity (g) is in the negative y direction.

Projectile Motion

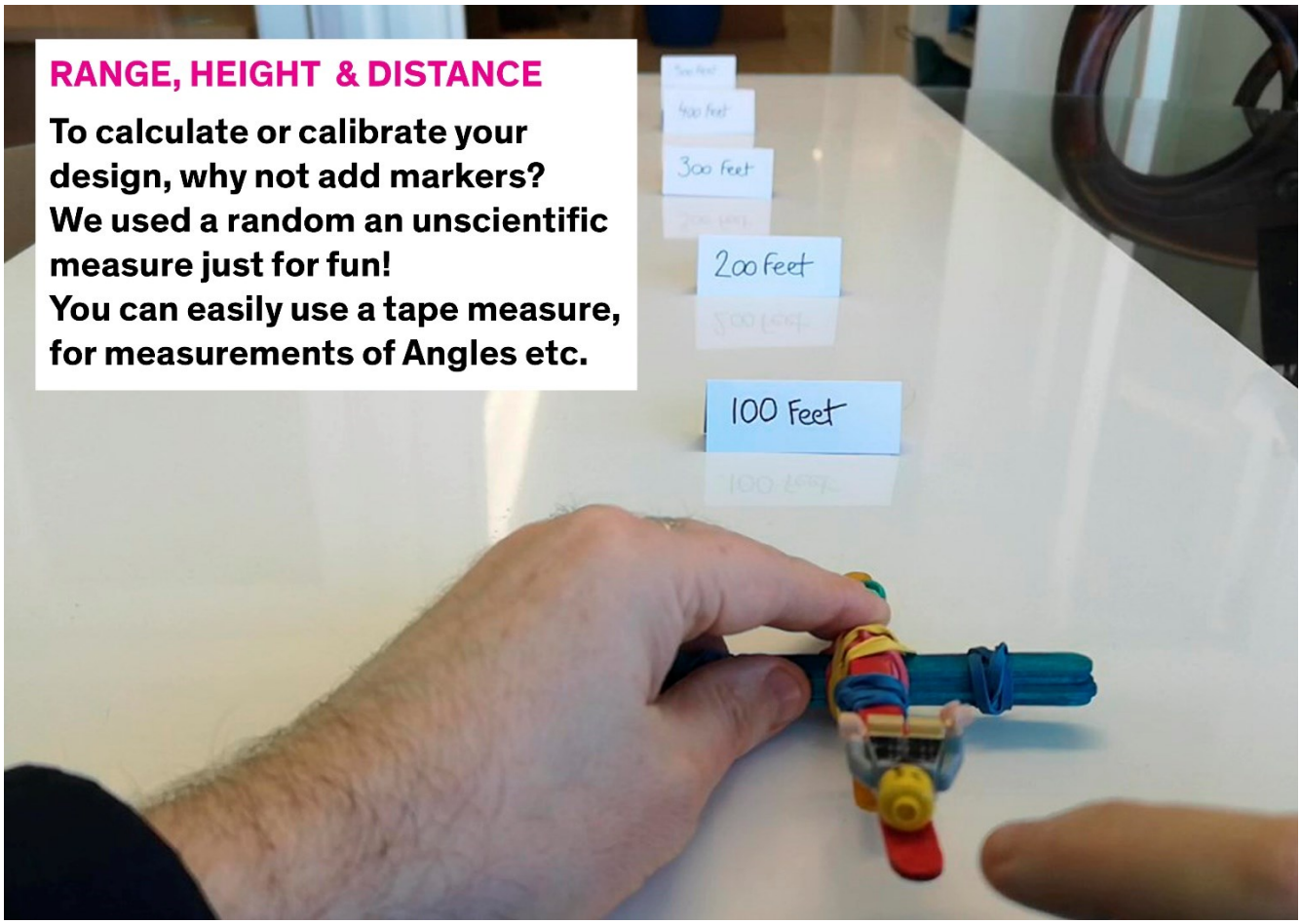
Projectile motion refers to the method used for calculating the trajectory of a projectile (which can be pretty much any physical object — a rock, a ball, etc.) as it moves through the air.
Understanding projectile motion requires an understanding of **position** (the location of the ball, or projectile), **velocity** (how fast the ball is moving), and **acceleration** (how fast the velocity changes). A more advanced understanding of projectile motion involves calculus and factors like air resistance. For this project we will use simplified **constant acceleration equations**. These equations rely on the assumption that we can ignore **air resistance** — otherwise, the acceleration would change over time, and not be constant. (*Note: Hover over the equations in this Introduction with your cursor to view enlarged formulas.*) The four equations are:

Equation 1:
df=di+vit+12at2df=di+vit+12at2
Equation 2:
vf=vi+atvf=vi+at
Equation 3:
v2f=v2i+2a(df−di)vf2=vi2+2a(df−di)
Equation 4:
df=di+12(vf+vi)t

READ MORE: There is a brilliant resource on Maths and Physics here.

https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p089/physics/physics-of-catapult-projectile-motion#background

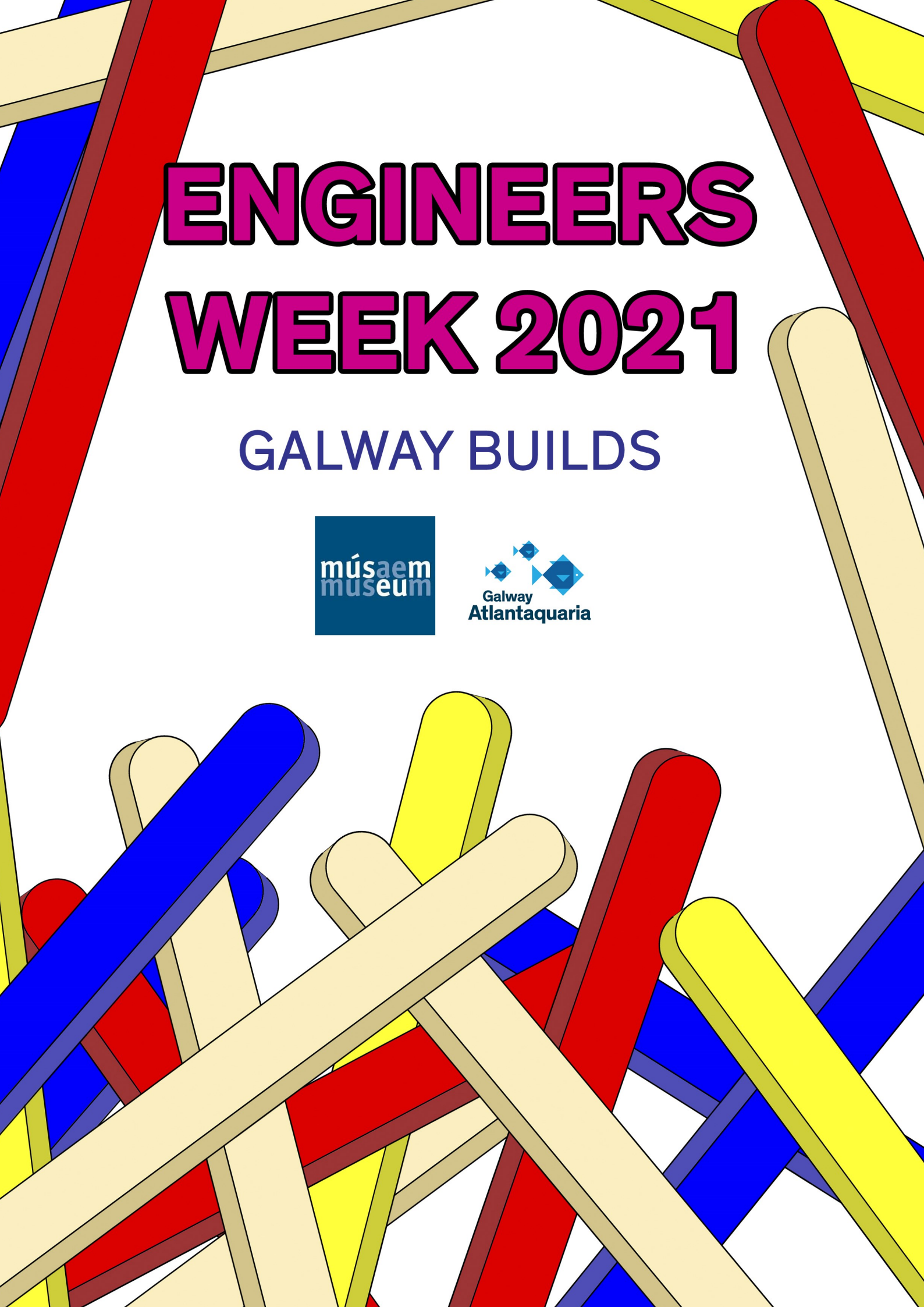
RANGING IDEAS/CLASSROOM FUN



SHARE YOUR DESIGNS WITH US!

The Aquarium would love to see photos of your creations, please send your design to;

garry@nationalaquarium.ie

ENGINEERS WEEK 2021

GALWAY BUILDS