



# Juggling (Devil) Sticks

Robert Stavins

# Traditional Devil Sticks



# Variation on Devil Sticks

Flower Sticks

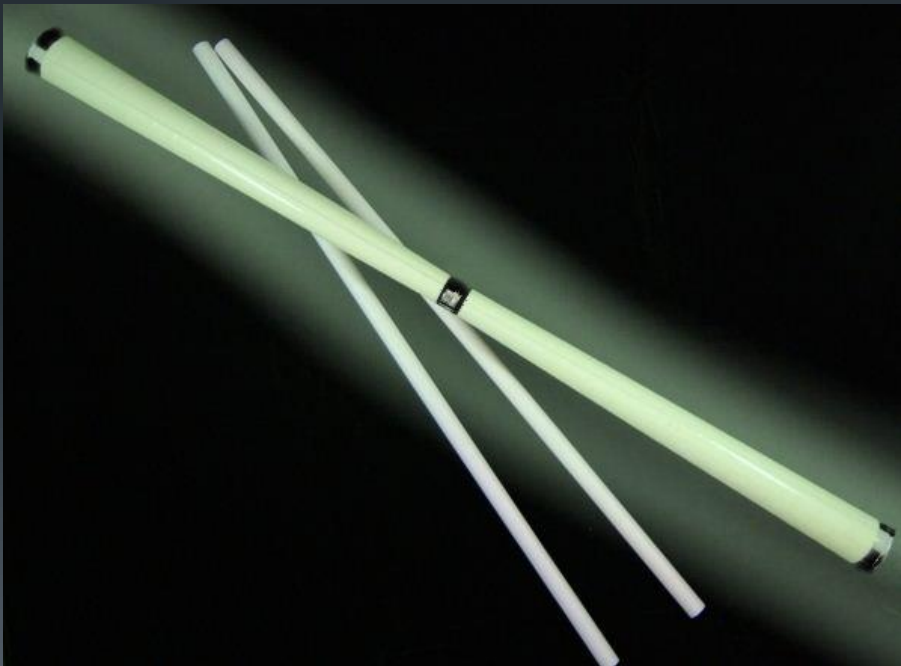


Tao Stix

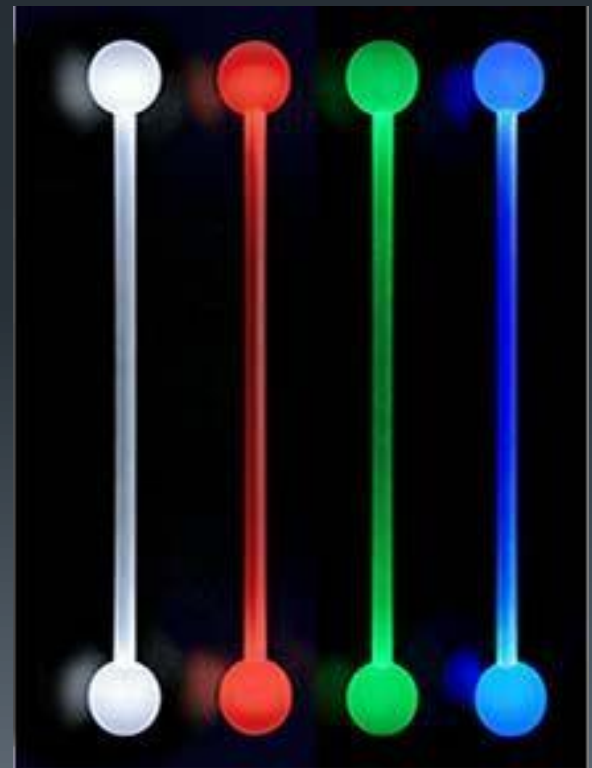


# Variations cont.

Glow in the Dark



LED Light Up



# Variations - Fire Sticks





# Design of Devil Sticks

- Weight focused at the ends to create large “sweet spot”
- Creates an illusion that laws of physics are being broken



# Physics of Design

Impact of length and weight of middle stick:

Look at  $\tau = I \alpha$

$\tau$  is torque, the cross product of force and radius,

$I$  is the moment of inertia,

$\alpha$  is rotational acceleration,

Our original formula can be rearranged  $\alpha = \tau/I$