

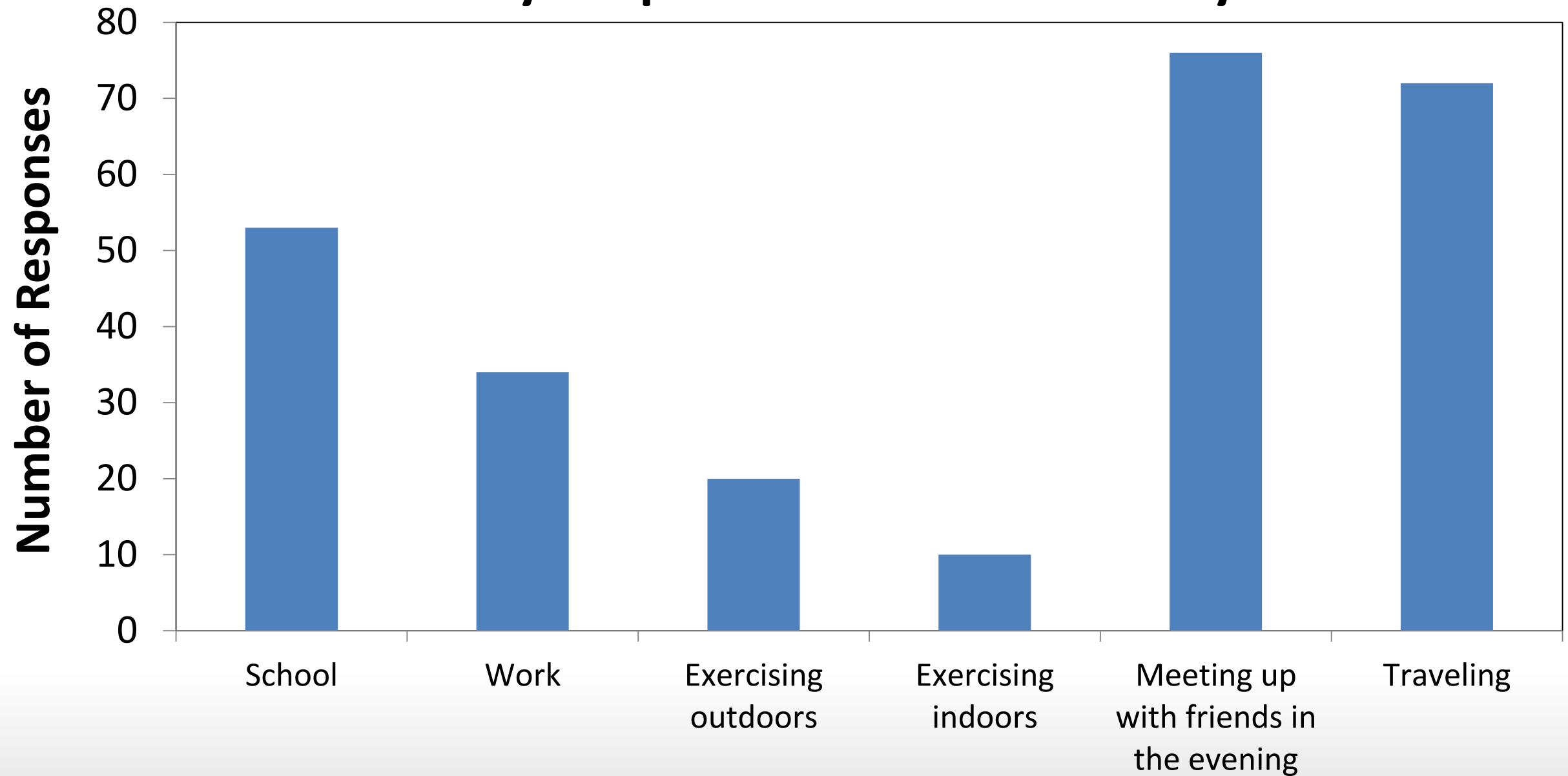


C H A R G E

A wearable device that generates power from kinetic energy.



In what situations have you been inconvenienced because your phone ran out of battery?



Customer Need	Design Attribute	Specification
Can provide supplemental power to phone	Energy Capacity	> 0.5 Wh
Comfortable to have on your person	Volume	< 55 cm ³
	Weight	< 8 oz
	Person willing to wear for 6+ hours	yes/no

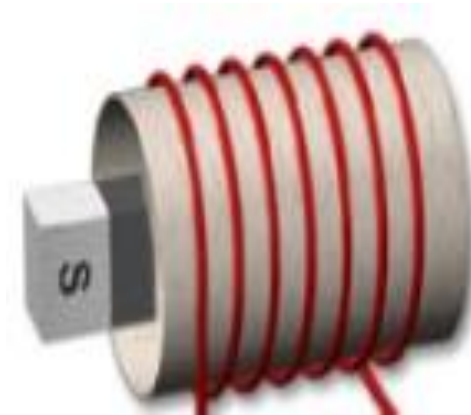
1. Energy Generation

2. Form Factor

1. Energy Generation



Piezoelectric



Magnetic Induction

1. Energy Generation



Piezoelectric

OCTOBER 2014						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

1. Energy Generation

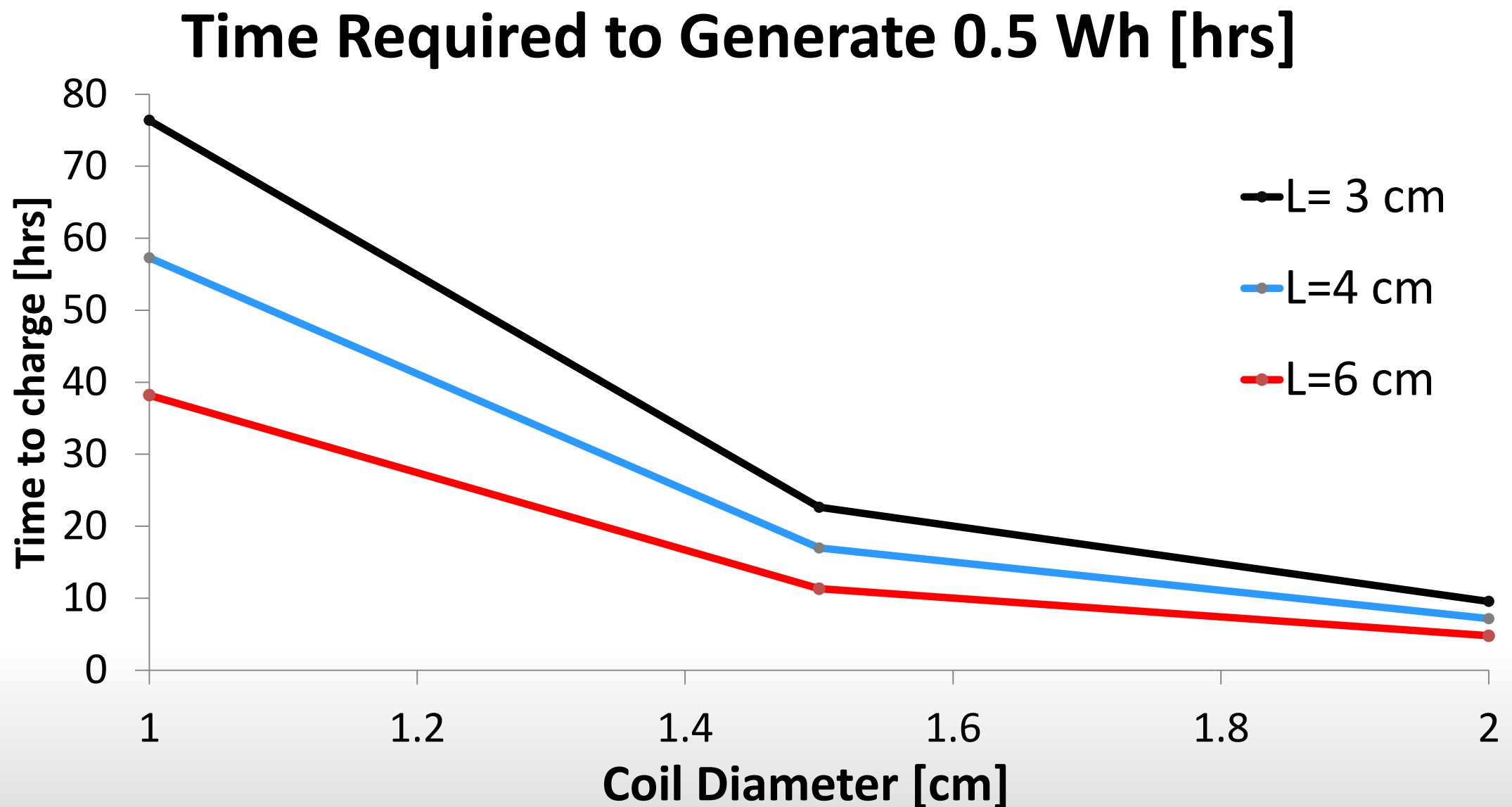


Magnetic Induction

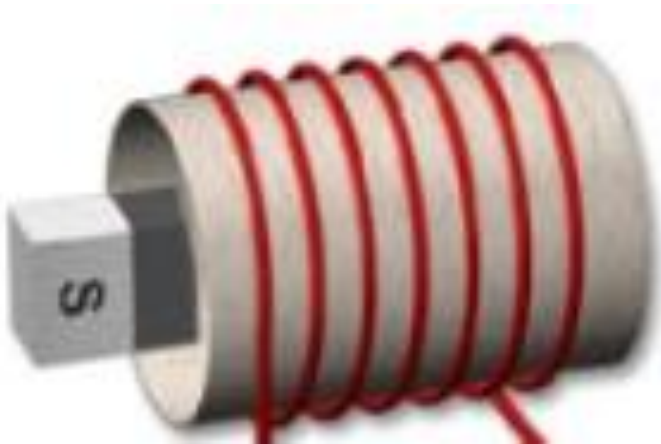
Faraday's Law:

$$EMF = -n \left(\frac{d\phi_B}{dt} \right)$$

1. Energy Generation

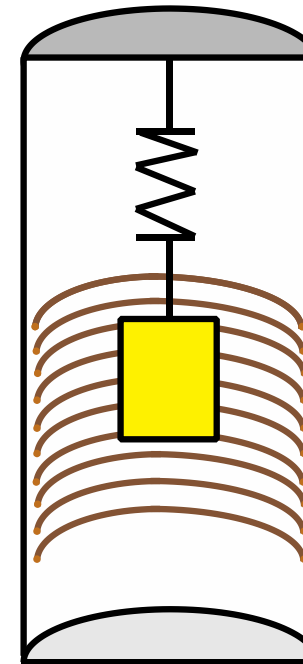


1. Energy Generation



**Magnetic
Induction**

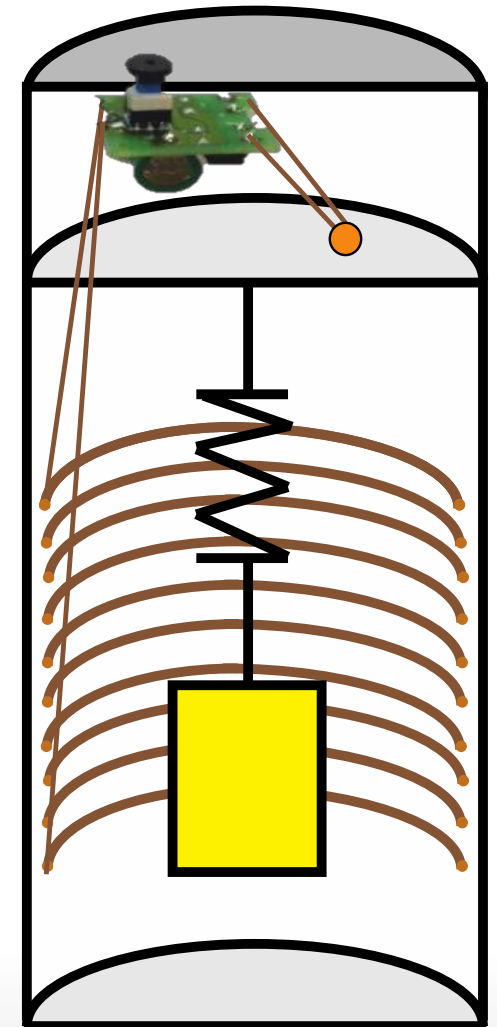
$$K = 39 \text{ N/m}$$



2. Form Factor



Physical Model



Reduce Size

Further tune
springs to
walking
frequency

More body
locations



C H A R G E