



# Presentation 2 - Concept Gen and Evaluation

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ME 476C Kinetic Sculpture 2018-2019  
Team 18F02 KineticA





# Project Description

- Team is to construct a kinetic sculpture that will be displayed in the Engineering building.  
The sculptor must illustrate at least three engineering principles.
- The project sponsor and client is Dr. Sarah Oman.
- Stakeholders include current and future students and faculty.
- Project Purpose: Display physical example of mechanical engineering principles in an engaging manner and representing the Mechanical Engineering Department in a positive, marketable light.

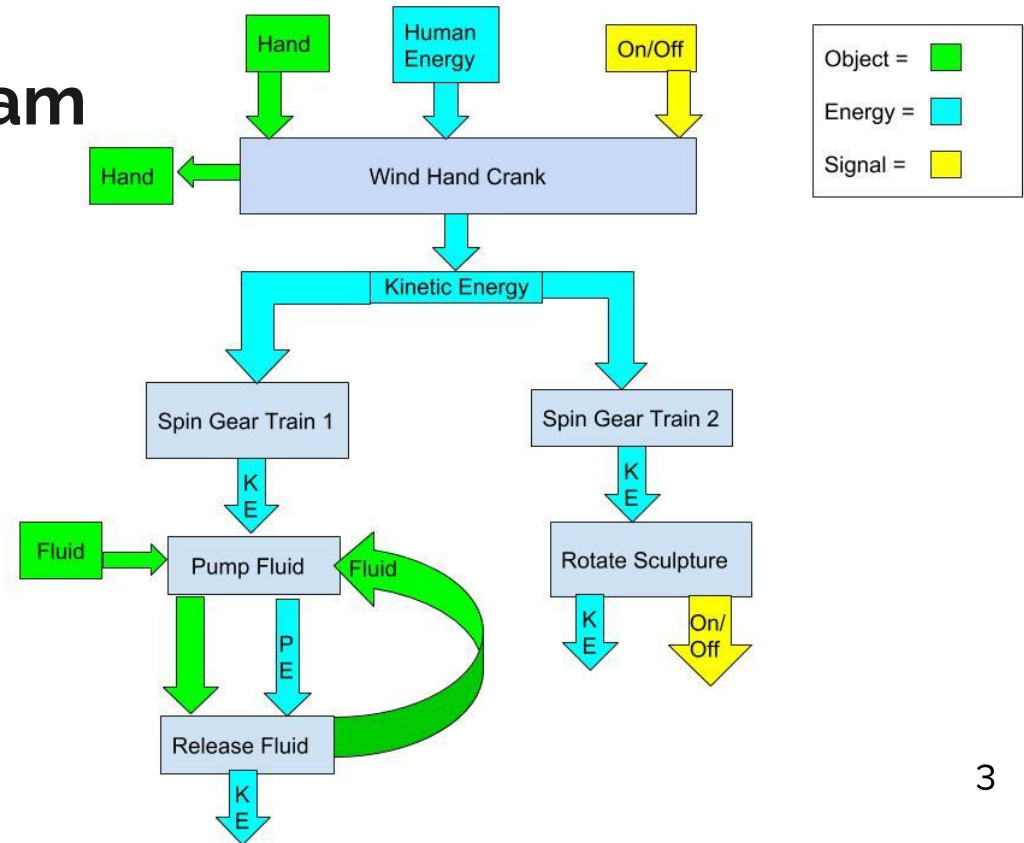


## Black Box Model



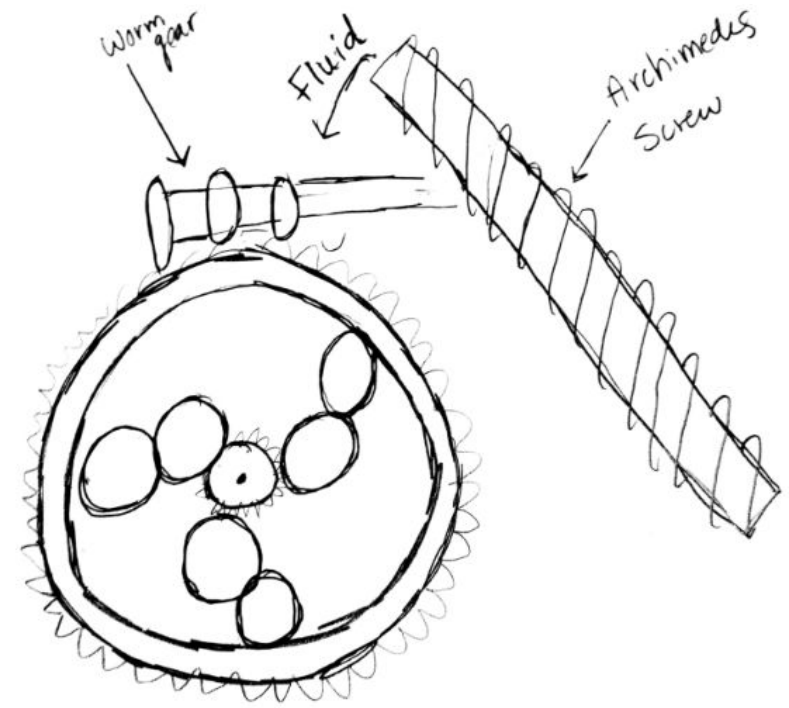
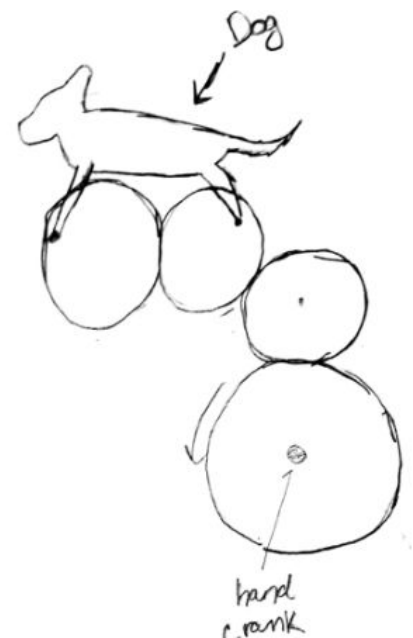


# Work Process Diagram



# Designs Considered

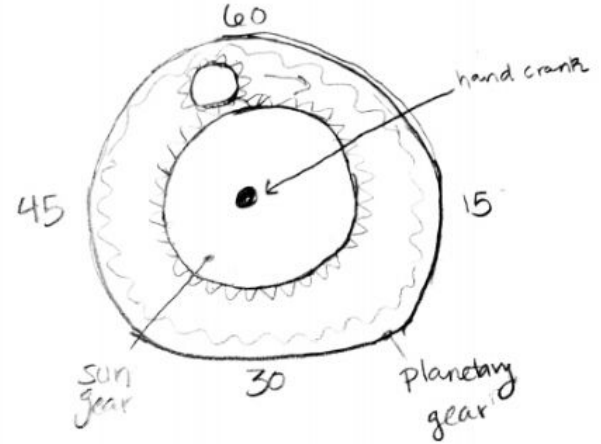
- Run, Doggie, Run
- Archimedes Screw





## Designs Considered

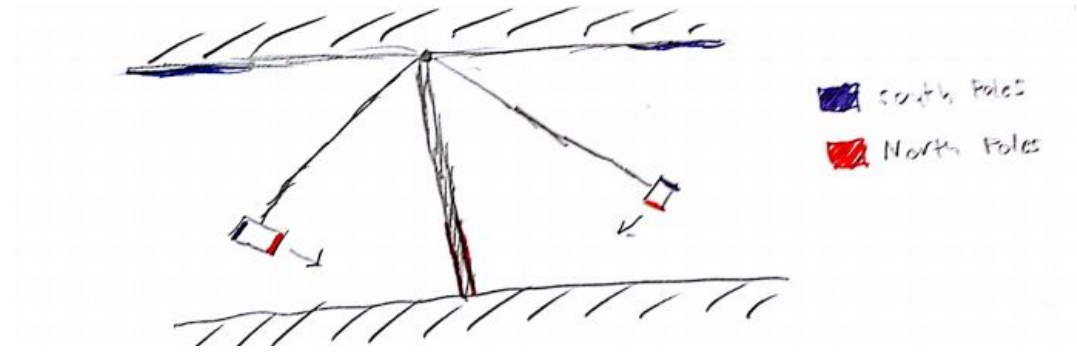
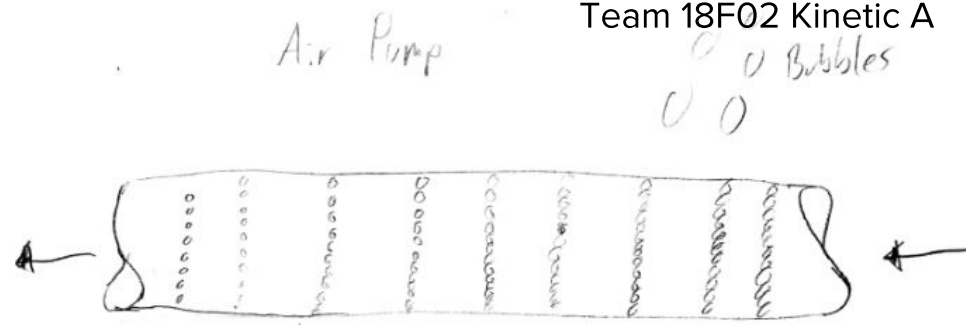
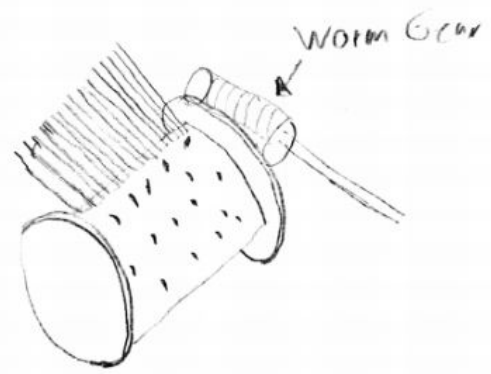
- 60 seconds
- Solar System





# Designs Considered

- Music Box
- Magnetic Pendulum
- Bubble Blower





# Pugh Chart

Concept	52 Card Shuffle	Archimedes Screw	60 Seconds	Run, Doggie, Run	Double Pendulum	Shape Shift	Solar System	OG	5 o'clock Somewhere	Block O'Gears	Magnet Pendulum	Swirly Boy	Wet N' Wild	Magnetic Ball	Tech-tonic Plates	Radioactive Monkey	Railgun	Music Box	Bubble Blower	Radioactive Power
Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Moveable (Can Fit Through Door)	-	D	S	#	S	-	S	S	-	S	-	S	-	#	-	-	-	#	#	S
Cost Effective	-	A	#	#	#	-	S	-	-	S	-	S	-	#	-	-	-	-	#	#
Durable	S	T	S	S	S	S	-	S	S	S	-	-	-	-	-	-	-	-	S	S
Represent Engineering Positively	S	U	-	-	-	-	#	S	-	-	#	-	S	-	-	-	-	#	S	-
Safe To Use	-	M	S	#	S	S	S	S	#	S	#	S	-	S	-	-	-	#	#	-
Visually Pleasing	#	-	-	#	-	S	#	-	S	-	S	S	-	#	-	S	-	S	S	S
Reliable	-	-	S	S	-	-	-	-	S	-	S	-	S	-	-	-	-	-	#	-
Σ# (Positive)	1	4	4	4	1	0	2	0	1	0	3	0	0	3	0	0	2	4	2	0
Σ- (Negative)	4	2	1	1	3	4	2	4	3	3	2	4	5	3	7	6	5	0	2	6
ΣS (Same)	2	3	3	3	3	3	3	3	3	4	2	3	2	1	4	0	1	0	3	1
Total Positive or Same	3	3	4	5	2	6	4	3	3	4	4	2	3	2	2	1	4	0	0	1

Concept	Archimedes Screw	60 Seconds	Run, Doggie, Run	Solar System	Magnet Pendulum	Music Box	Bubble Blower
Criteria	1	2	3	4	5	6	7
Moveable (Can Fit Through Door)	D	S	#	S	-	#	S
Cost Effective	A	#	#	S	#	#	#
Durable	T	S	S	-	-	S	S
Represent Engineering Positively	U	-	-	#	#	S	-
Safe To Use	M	S	#	S	#	#	#
Visually Pleasing	-	#	#	#	S	S	S
Reliable	-	S	S	-	S	#	-
Σ# (Positive)		1	4	2	3	4	2
Σ- (Negative)		2	1	2	2	0	2
ΣS (Same)		4	2	3	2	3	3
Total Positive or Same		5	2	6	5	5	5





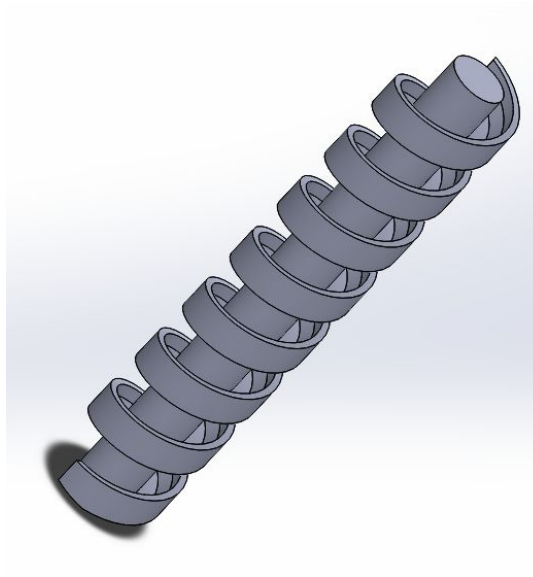
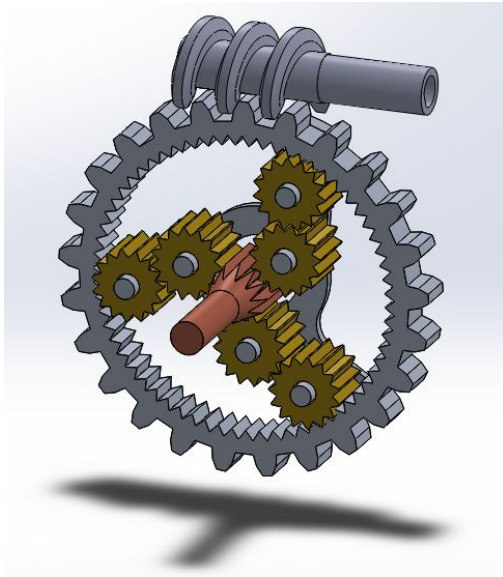
# Decision Matrix

		Sculpture Concepts (Scale 0-100)								
		Criteria	Weight (RTD)	1 Archimedes Screw	2 60 Seconds	3 Run, Doggie, Run	4 Music Box	5 Bubble Blower	6 Solar System	7 Magnetic Pendulum
Engineering Requirements	1	Less Than 150 Lbs	21%	90	80	80	70	70	80	80
	2	Under 3x3x6	12%	90	80	90	70	70	60	90
	3	Under \$5000	8%	90	80	90	50	60	90	70
	4	Material Strength	8%	70	60	60	50	50	50	40
	5	Hardness	3%	60	60	60	40	60	60	60
	6	Corrosion Rate	6%	60	70	50	70	40	70	90
	7	Factor of Safety	15%	20	50	40	60	80	80	40
	8	At Least 3 Principles	7%	100	80	100	100	80	70	100
	9	Operational For 30 min	6%	80	80	80	50	60	80	40
	10	Low Power Requirement	3%	80	80	80	50	70	80	80
	11	9/10 People Like	12%	90	90	80	90	90	80	70
		<b>Raw sco</b>	75.9	74.7	74.2	67.8	70.2	74.9	69.8	
		<b>Relative Rank</b>	1	3	4	7	5	2	6	



Jonathan Walgren  
October 15, 2018  
Kinetic Sculpture  
Team 18F02 Kinetic A

## Design Selected - Archimedes Screw



Mechanism of Power:  
Constant Torque Spring

Fluid Flow

Stationary Sun Gear



# Schedule & Budget

Budget - \$3000

Budget Left - \$3000



# Questions?

