Mission Possible -B- Score Sheet-2022

School: _____   Team #: _____

Names: _____

	INSPECTION for Participation	(✓/✗)
2b.	Team always wore proper eye protection. **(1 Warning, then DQ).**	
3a.i	All dimensions of the device are 1 meter or less.	
3a.vi	No electricity is used anywhere in the device.	
3a.vii.	Device is free of candles, flames, matches, rat traps, lead objects, combustible fuses, dry ice, liquid nitrogen, flammable gas, and hazardous liquids, gases & materials.	
2c.	All safety concerns were resolved by the team to the judges' satisfaction before operation.	
	If any violations are marked (*x*), device only receives participation points. (Explain on back.)	

	CONSTRUCTION PARAMETERS: If a line is marked "x", then a penalty is made and/or an action does not count.	(✓/✗)
3a.ii	All actions used for scoring are visible and/or verifiable. The device is free of parallel & dead-end paths.	
3a.iii	All marbles are glass spheres and have a diameter between 1 and 3 cm. None are altered or glued.	
3a.iv	Each movable/adjustable physical object in the device is used for no more than one assigned action.	
	Device designed/constructed as sequence of actions including the mechanical timing step. intended to operate autonomously after Start. **(Outside help/control = DQ)**	

3c. Scorable Actions – Check each one completed as described in the rules. (Multiply total X 50 on 5c.ii)

_____ 1. Use falling marble to operate a wheel & axle so it raises another marble 10 cm to initiate the next action.

_____ 2. Use a marble to knock over a series of three free-standing dominos so the 3rd one moves a marble that then initiates the next action.

_____ 3. Wedge 2 touching marbles apart so one moves 20 cm. to initiate the next action.

_____ 4. Use water to raise a marble $\geq$5 cm so the marble rolls out the top of the container to initiate the next action.

_____ 5. Use a falling marble to raise a 3rd class lever to raise another marble at least 5 cm. before it initiates the next action.

_____ 6. Use a 1st class lever to raise a cup containing 10 marbles 10 cm before the cup initiates the nest action.

_____ 7. Use a single marble to hit a chain of 5 touching marbles so the last marble moves at least 10 cm and then initiates the next action.

_____ 8. Drop 5 marbles into a cup, one at a time, so that the last marble causes a pulley system with IMA of 3 to raise an object at least 10 cm, before the object initiates the next action.

_____ 9. Push or pull a marble up an inclined plane with an IMA $\geq$ 2 at least 10 vertical cm so it then initiates the next action.

_____10. Launch a marble out of and above the device so it strikes an object 20 cm. away as it re-enters the device to initiate the next action.

_____11. Use falling marbles to turn a paddlewheel so that it makes one full revolution before triggering the next action.

_____12. Use an Archimedes screw to raise a marble 20 cm. vertically before the marble triggers the next action.

Length= _____   Width=_____   Height=_____

	SCORING	Max	Earned
6b.i	The Action Sequence List (ASL) were submitted on time (as specified by the Director.)	25	
6b.ii	Action Sequence List (ASL) uses specified format.	25	
6b.iii	Action Sequence List (ASL) is 100% accurate in intention	25	
6b.iv	All Actions within the device are labeled as in the ASL	25	
6c.i	The team set-up the device and adjusted for target time within 30 min.	50	
6c.ii	The first time each action in 3c. is successfully completed as described. (50 ea., Limit=12)	600	
6d.	Participants drop a marble into the device, from above the device, so it starts the next action and comes to rest on the base of the device.	100	
6e.	After all other planned scorable actions have been attempted, the marble from the Start Action is struck so that it rolls at least 30 horizontal cm on the "floor" of the device from its original resting position and stops on its own on the base and within the device.	250	
6f.	If the first marble strikes a second one that is at least 30 cm. away and both stop rolling within the device without touching anything else, award . . .	100	
6g.	If a 20 cm. diameter circle is drawn with the second marble at its center and the second marble completely leaves the circle after being hit by the first marble, and both stay in device without touching anything else, then award	75	
6h.	If all parts of final task are completed and the first marble remains completely in the 20 cm. circle after knocking the second marble out, then award	50	
6i.	2 points for every **full** second of operation up to ideal sec. (ACTUAL TIME:_____)		
6j.	1 pt. per full second that a sand timer runs before the Target Operation Time if timer runs at least 10 sec. total and initiates the next action. **Sec: Start _____ End _____**		
6k.	**(Face-to-face only)** .1 pt per .1 cm that a dimension is under 60. Max per dimension is 30	90	
6l.	If the device that has no touches, then award 75 points.	75	
	TOTAL Points Earned (Show on front page.)	=	

	PENALTIES: (Subtract from Points Earned)	Penalty	Total
7a.	1 pt. per **full** second the device ran beyond target time (OVER BY:_____ sec)		
7b.i	Number of dimensions exceeding 60 cm. imaginary cube = _____ X 25 =	Max=75	
7b.ii	If the top and 2 vertical walls are not open or transparent, deduct 25 pts.	25	
7b.iii	Deduct 25 pts. /touch, up to 3. If the device stops after the third touch, it will not be allowed to be touched/adjusted and the time will be scored as 180.0 seconds.	25,50,75	
7c.	50 pts, one time, for any part or substance leaving the boundary of the device.	50	
7d.	Devies using electricity will not be allowed to run.		
		TOTAL =	

Total Points Earned= _____ Minus Penalty Points _____ = Final Score _____

(Tiebreakers: 1-fewest penalty pts.; 2-Smallest total dimensions)