

## IAJES CHALLENGE PROPOSAL

The main objective is to have many students from many IAJES Universities **collaborating** to design a 3Dprinted part that holds the maximum force/weight and force/manufacturing time before touching an intermediate obstacle.

### Scores First round 10 points

- 3 Points for maximum load/weight according to best result (current is maximum with 68N/g)
- 3 Points for maximum load/fabrication time according to best result (current is maximum 13.3N/min)
- 2 Points for report describing how they defined their approach to obtain the best score from above and how they split team work
- 2 Points for presentation of results and including what they learnt in this project

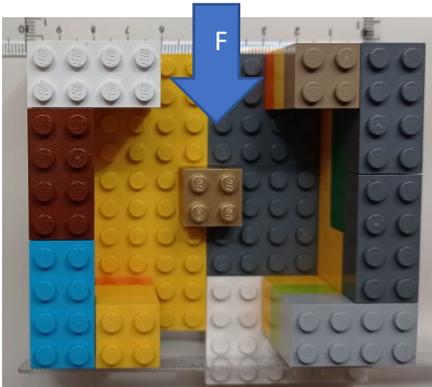
### Scores Second round 30 points

- 30 points to be discussed by Jury along first round

### Dimensions:

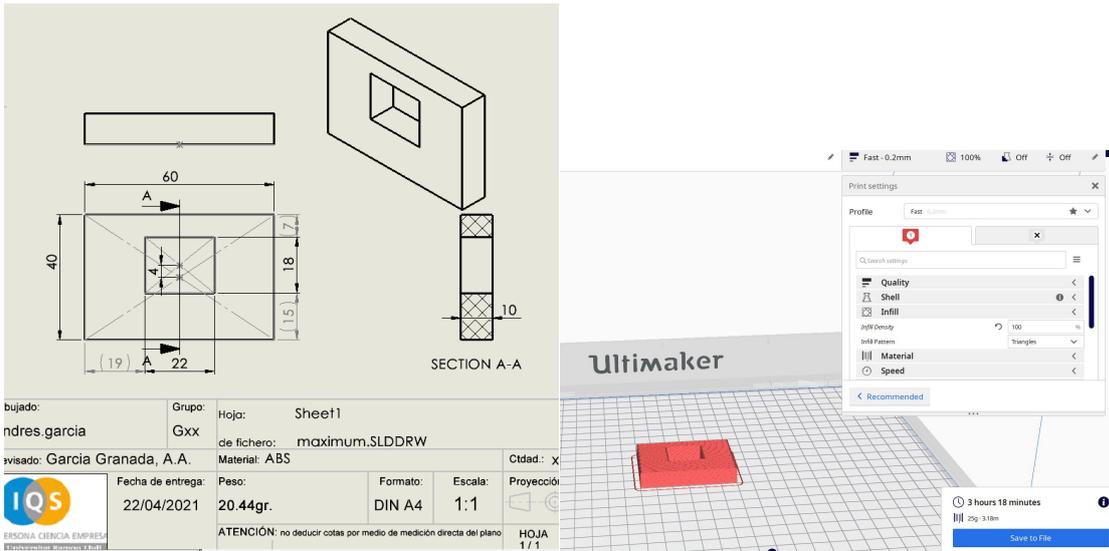
Maximum dimensions to place part 8x6 lego distance, approximately 64x48mm

Part designed maximum 60x40x10mm avoiding contact with central golden part of 16x16mm



### Maximum size

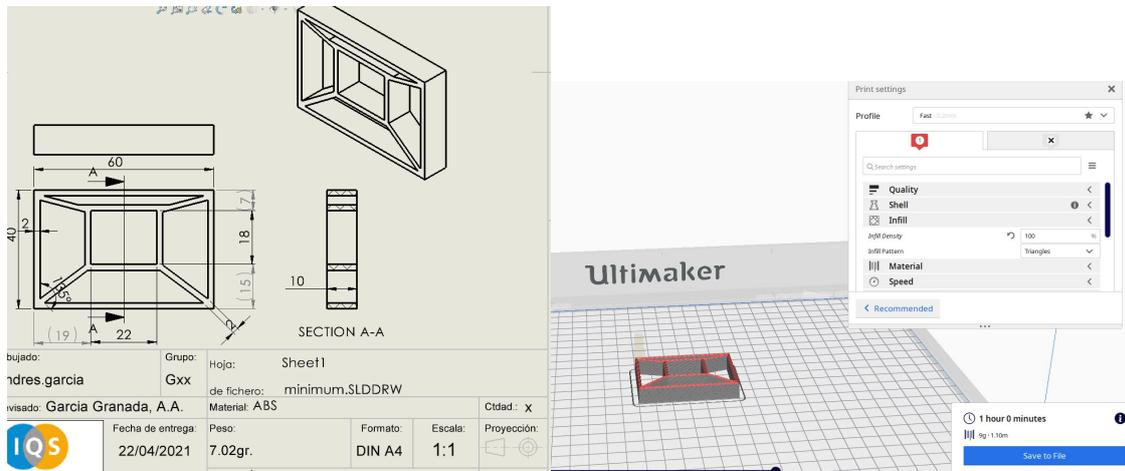
A possible example of maximum size follows



With Cura 4.8.0 <https://ultimaker.com/es/software/ultimaker-cura> defining Ultimaker S5 with Tough PLA in extruder one and Fast 0.2mm with 100%infill we require 25g and 3hours 18 minutes

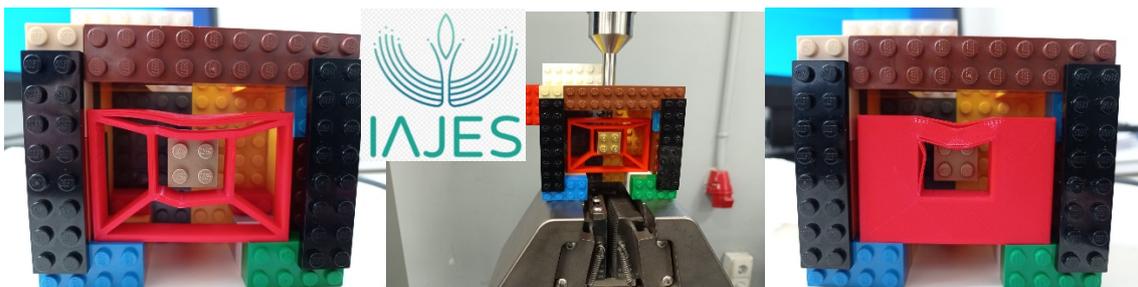
## Minimum time and weight possibility

Another proposal of minimum weight and time follows



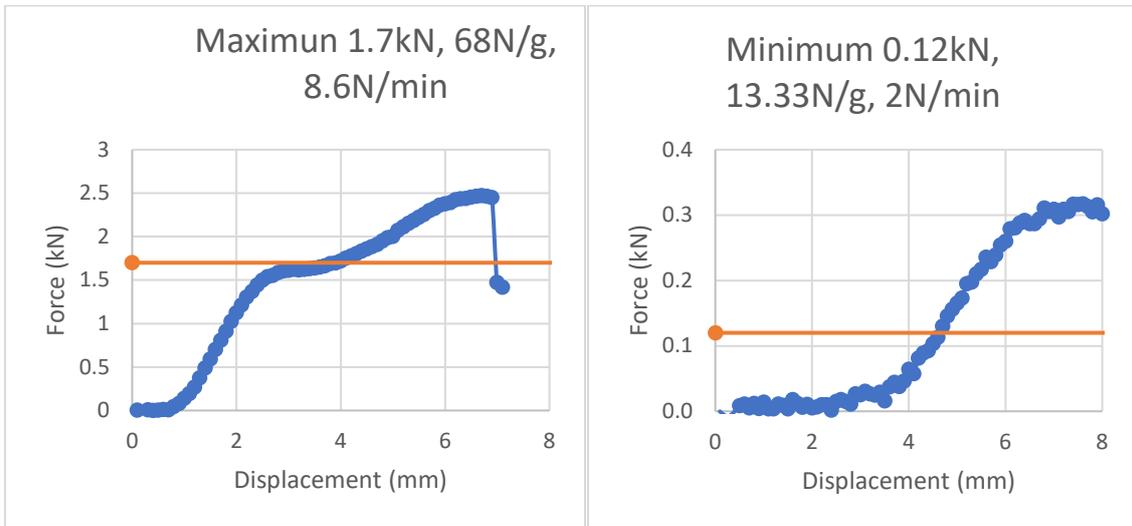
## Testing

Testing is carried out at 0.1mm/sec with a diameter 8mm flat cylinder



## Comparison of initial results

	Weight (g)	Time (min)	Ftouch(kN)	Ft/m(N/g)	Ft/t(n/min)	Fmax(kN)	Ft/m(N/g)	Ft/t(n/min)	FSW(kN/mm)	FSW/m(N/mm.g)	FSW/t(N/mm.min)	Points t N/g	Points t N/min	Points m N/g	Points m N/min	Points SW N/g	Points SW N/min
maximum	25	198	1.7	68.00	8.586	2.5	100	12.6	2.42	96.8	12.2	3.000	3.000	3.000	3.000	2.614	2.200
minimum	9	60	0.12	13.33	2.000	0.32	35.56	5.3	1	111.1	16.7	0.588	0.699	1.067	1.267	3.000	3.000



\*Maximum and Minimum STL and Ultimaker files are available for download at:  
<https://meaagg.com/IAJES/IAJES-Challenge.zip>

## Timing

- Saturday 5<sup>th</sup> June @10am UCT to send a zip file with STL, Ultimaker file, pdf report max 5 pages and video-presentation of max 1minute for 1<sup>st</sup> round  
[https://docs.google.com/forms/d/e/1FAIpQLScGEZic9iZZ2naGIscs8yHHZnvm0byKK8eIaNmZ7apMQD71Kw/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLScGEZic9iZZ2naGIscs8yHHZnvm0byKK8eIaNmZ7apMQD71Kw/viewform?usp=sf_link)
- Saturday 19<sup>th</sup> June @10am UCT report from jury with experimental results and initial scores and presentation of new rules for the second round. Web meeting with open discussions.
- Saturday 26<sup>th</sup> June @10am UCT to send a zip file with STL, Ultimaker file, pdf report max 5 pages and video-presentation of max 2 minutes for 2<sup>nd</sup> round.
- Saturday 3<sup>th</sup> July @10am UCT report from jury with experimental results and final scores.