

Task 1 for (Group A) 04.25.2022 (Group B) 04.27.2022



Design and construction of an autonomous vehicle that can harvest geometries with a box shape of 50mmx50mmx50mm

You can use any 3d/CAD software that can export .step files. (Solid Works, Fusion 360, Rhinoceros or any freeware that can export .stl files and .dxf files)

The max. dimensions of your vehicle are $x < 30\text{cm}$, $y < 20\text{cm}$, $z < 20\text{cm}$. The methods to bring your design vision into the real world are FDM 3d printing with the material PLA and laser cutting with plywood with a thickness of 5mm. You can connect both materials with screws or glue.

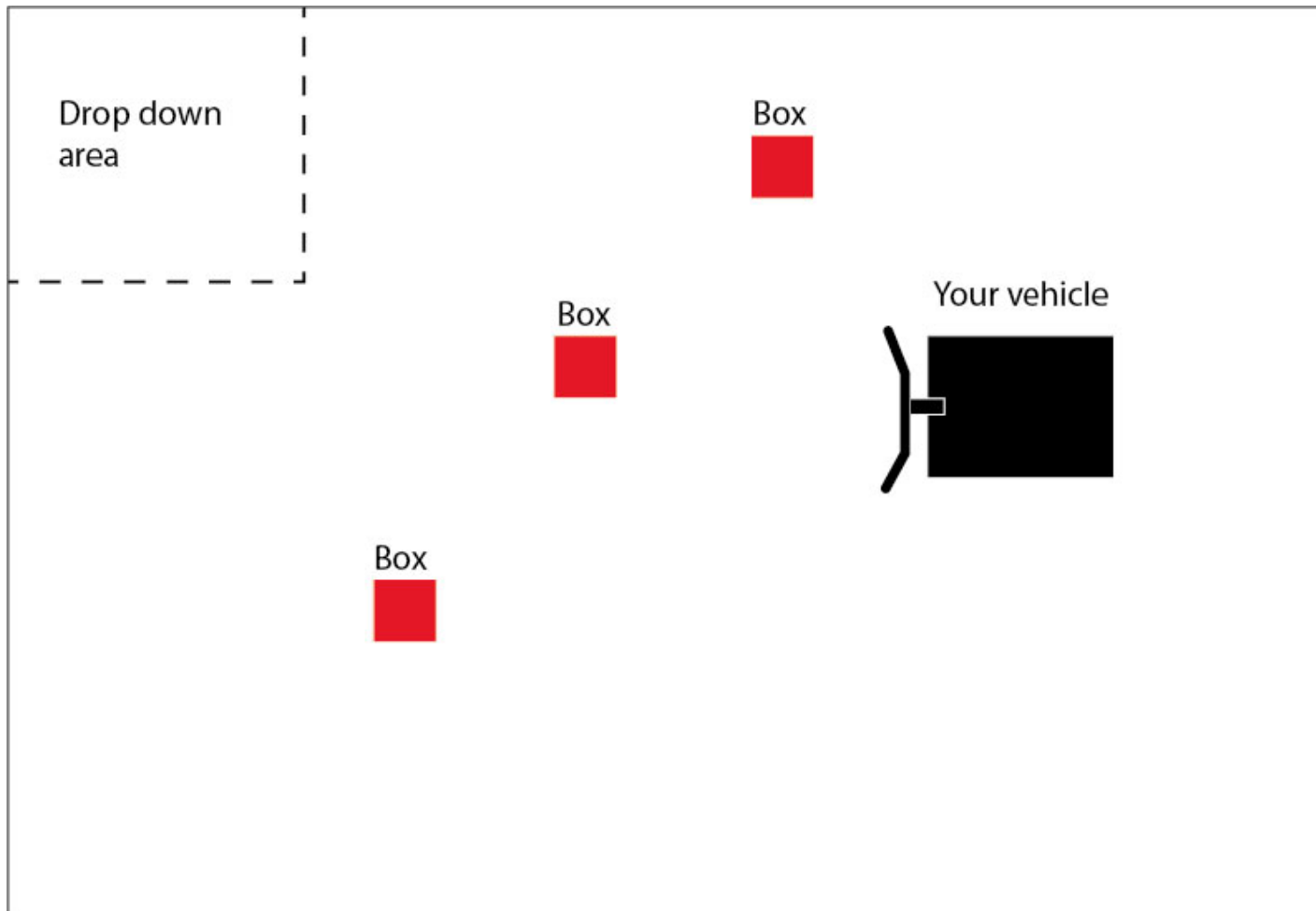
Keep in mind that we can only realise physical 3d models which are ready for 3d printing.

The overall printing time should not be more than 48 hours and the material consumption of the printing material PLA not more than 1 kg.

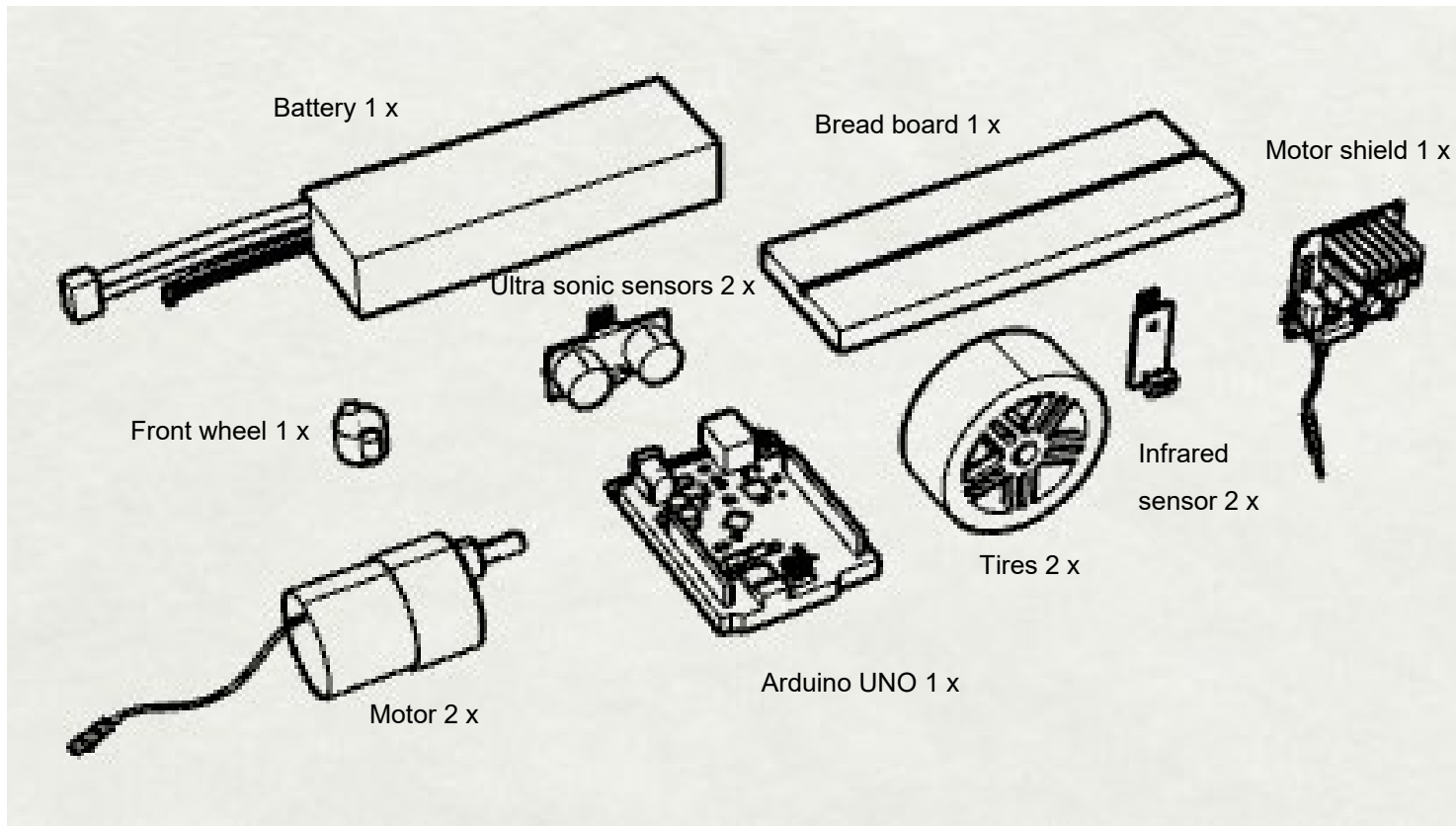
With this program you can check the weight of the parts and the material weight

<https://drive.google.com/file/d/1MdyrAZXzRCp11-EBymapPjWsSENIZafd/view>

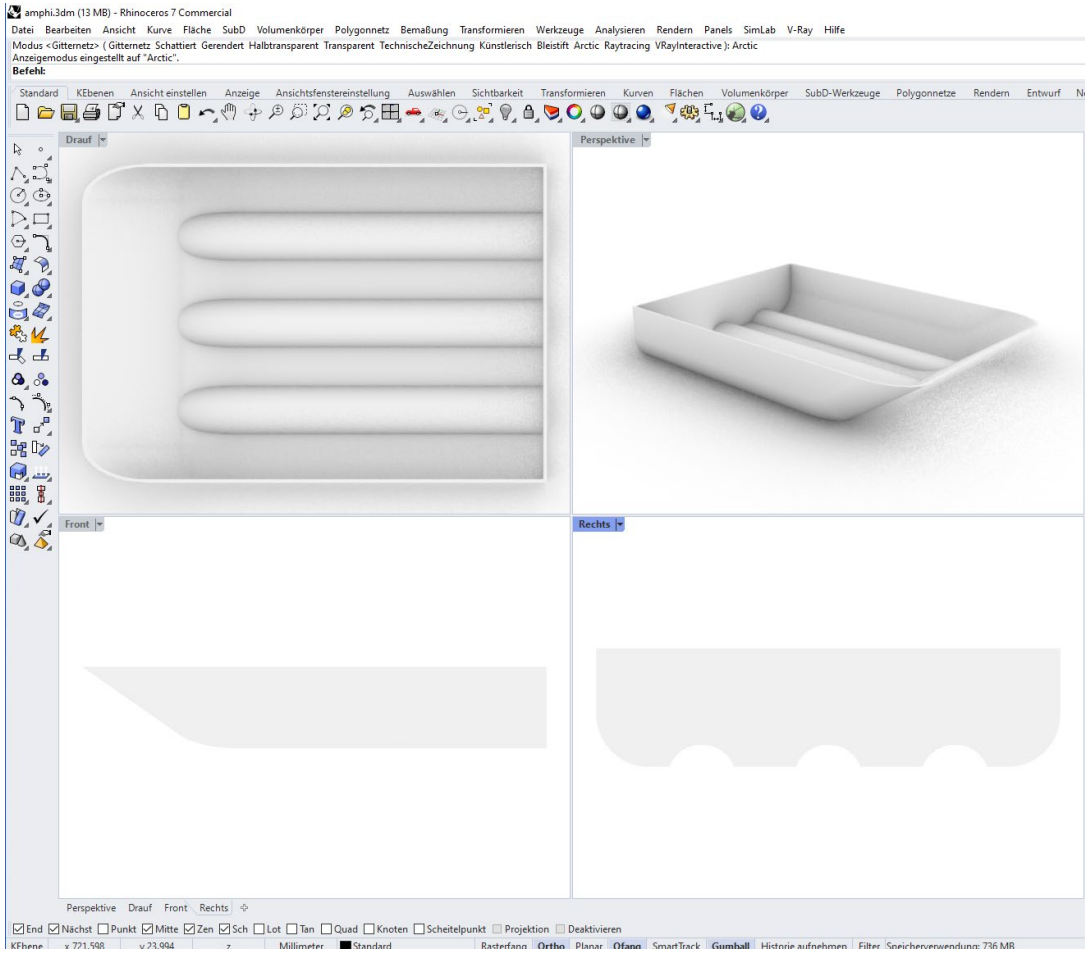
On May the 9th (Group A) and on May the 11th (Group B) your designed vehicles should be ready for production with the 3d printer and laser cutter.



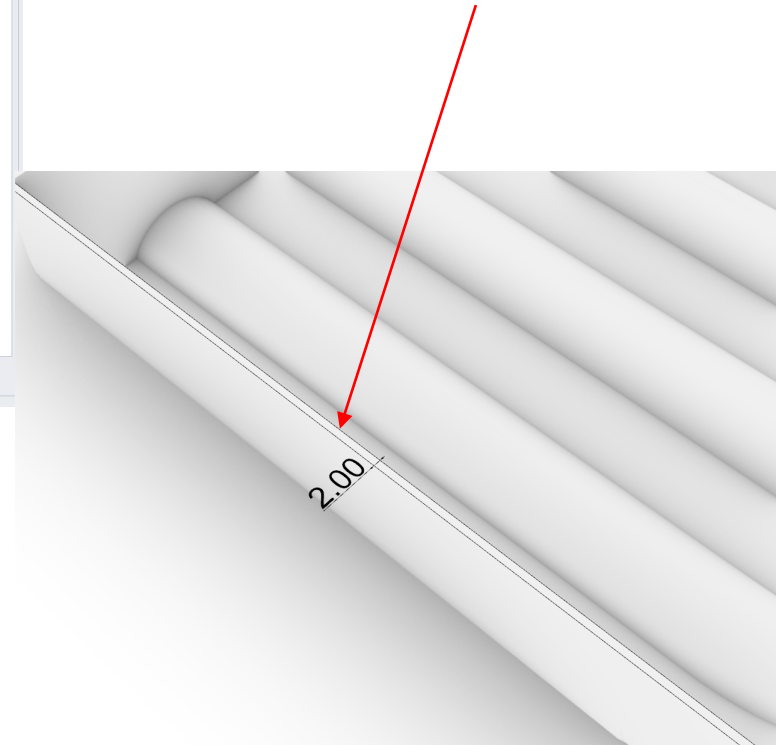
The task for your vehicle is to push (harvest) the boxes into the drop down area autonomously



Please use these 3d parts for your vehicle design. You can download them on moodle as .step files and convert them in a file that you can work with.



Design your 3d model as light as possible. The max. wall thickness should be less than 2mm



This is a screenshot of the slicing software Cura. Please use these parameters for your calculation

Cura - 15.04.6

Datei Werkzeuge Maschine Experte Hilfe

Grundlegend Fortgeschritten Erweiterungen Start/Br...

Qualität

Schichtdicke (mm) 0.2

Stärke der Außenhülle (mm) 0.8

Rückzug einschalten ☒

Füllung

Stärke Unten/Oben (mm) 0.6

Füllichte (%) 20

Geschwindigkeit und Temperatur

Druckgeschwindigkeit (mm/s) 50

Drucktemperatur (C) 210

Temperatur Drucktsch (C) 70

Stützmaterial

Art des Stützmaterials keine

Plattform Adhäsionstyp keine

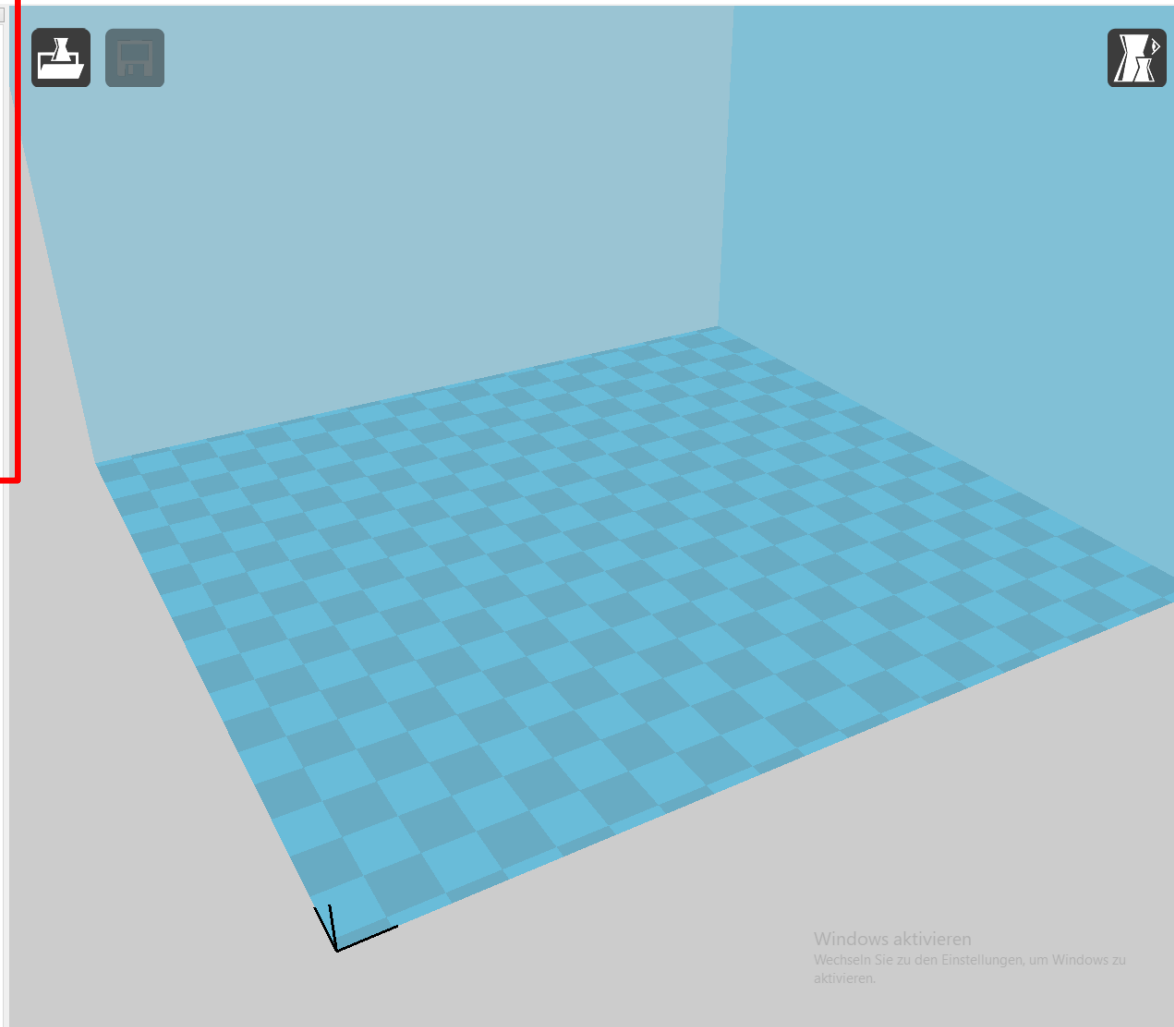
Druckmaterial

Durchmesser (mm) 1.75

Fluss (%) 100.0

Maschine

Größe der Druckdüse (mm) 0.4



HOCHSCHULE
HAMM-LIPPSTADT

When you import your modelparts the software shows the printing time. If your part is too big the software wont start the calculation. Then you have to cut the big part into several small parts and we glue it together.

