

WWW.TOOWHEELS.ORG

TOOWHEELS IS A DIY WHEELCHAIR, YOU CAN BUILD USING SIMPLE MATERIALS AND TOOLS: SOME PLYWOOD, SOME PIPES, SOME BICYCLE PARTS AND YOUR WHEELCHAIR IS READY!  
YOU CAN CHANGE DIMENSION AND SIZE, AND IF YOU WANT YOU CAN MAKE A CUSTOM WHEELCHAIR FOR ANY NEEDS YOU HAVE!

TOOWHEELS IS A PATENT PENDING PROJECT,  
RELEASED IN OPEN SOURCE VERSION (CC licence NON COMMERCIAL, SHARE ALIKE) TO BE USEFULL FOR PEOPLE ALL OVER THE WORLD. MAKE IT FOR YOUR FRIENDS, FOR PEOPLE OF YOUR CITY, MAKE IT IN A FABLAB OR A MAKERSPACE OR AT HOME!!

MAKE IT AND ENJOY!

FOLLOW US ON FB: **TooWheels**  
SITE: **WWW.TOOWHEELS.ORG**  
E-MAIL: **ALESSIOFABRIZIOGIORGIO@GMAIL.COM**



**supernova**  
creative innovation festival  
**LA STAMPA**



... ABOUT TOOWHEELS ...



**L'Espresso**  
**3D printing**  
creative  
THE MAKERS MAGAZINE



**WIRED** IT



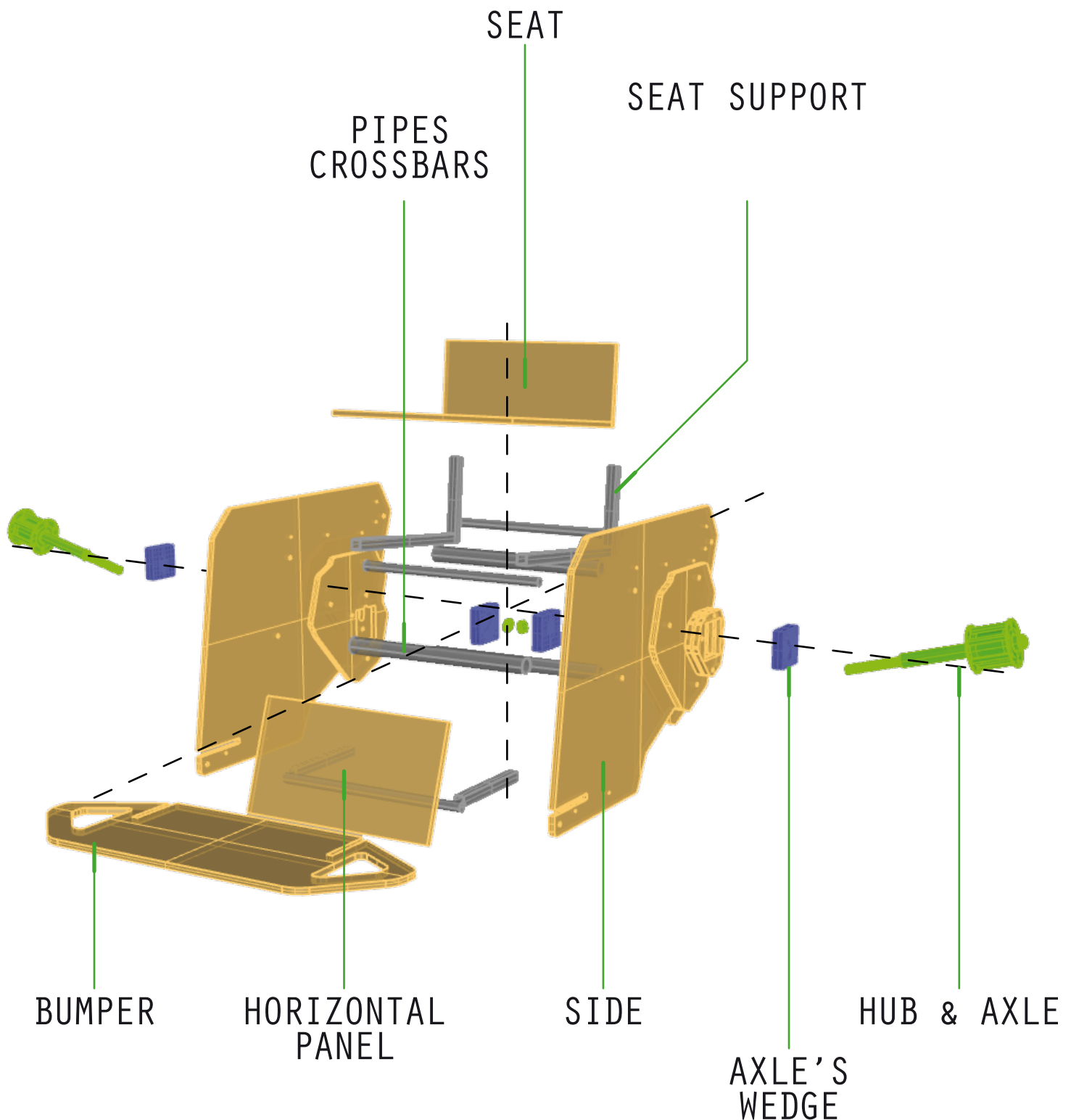
**StartupItalia!**



**MAKER CONTEST**  
Health and Quantified Self



# HOW IT'S MADE



# ***do it yourself! follow this steps!***

## STEP 1

- 1.1 - print the TW project sheets
- 1.2 - assembling the sheets using scotch tape
- 1.3 - customize the TW project's dimension and shapes
- 1.4 - cut the paper pattern and put on the plywood sheets
- 1.5 - sign up the outlines and holes with a pencil
- 1.6 - start cutting and drilling parts
- 1.7 - sand and smooth plywood

## STEP 2

- 2.1 - cut the pipes
- 2.2 - glue the plywood parts
- 2.3 - cut the hub's flange from the metal sheet
- 2.4 - cut and hole the wedge for the axle

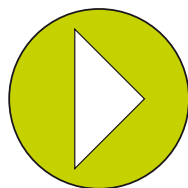
## STEP 3

- 3.1 - cut foam foil
- 3.2 - paint plywood
- 3.3 - assemble the hub
- 3.4 - assemble the wheel spokes

## STEP 4

- 4.1 - assemble and fix all the part
- 4.2 - cut the excess part of the threaded rods
- 4.3 - fix foam
- 4.4 - let's play!

WATCH THE VIDEO TUTORIAL



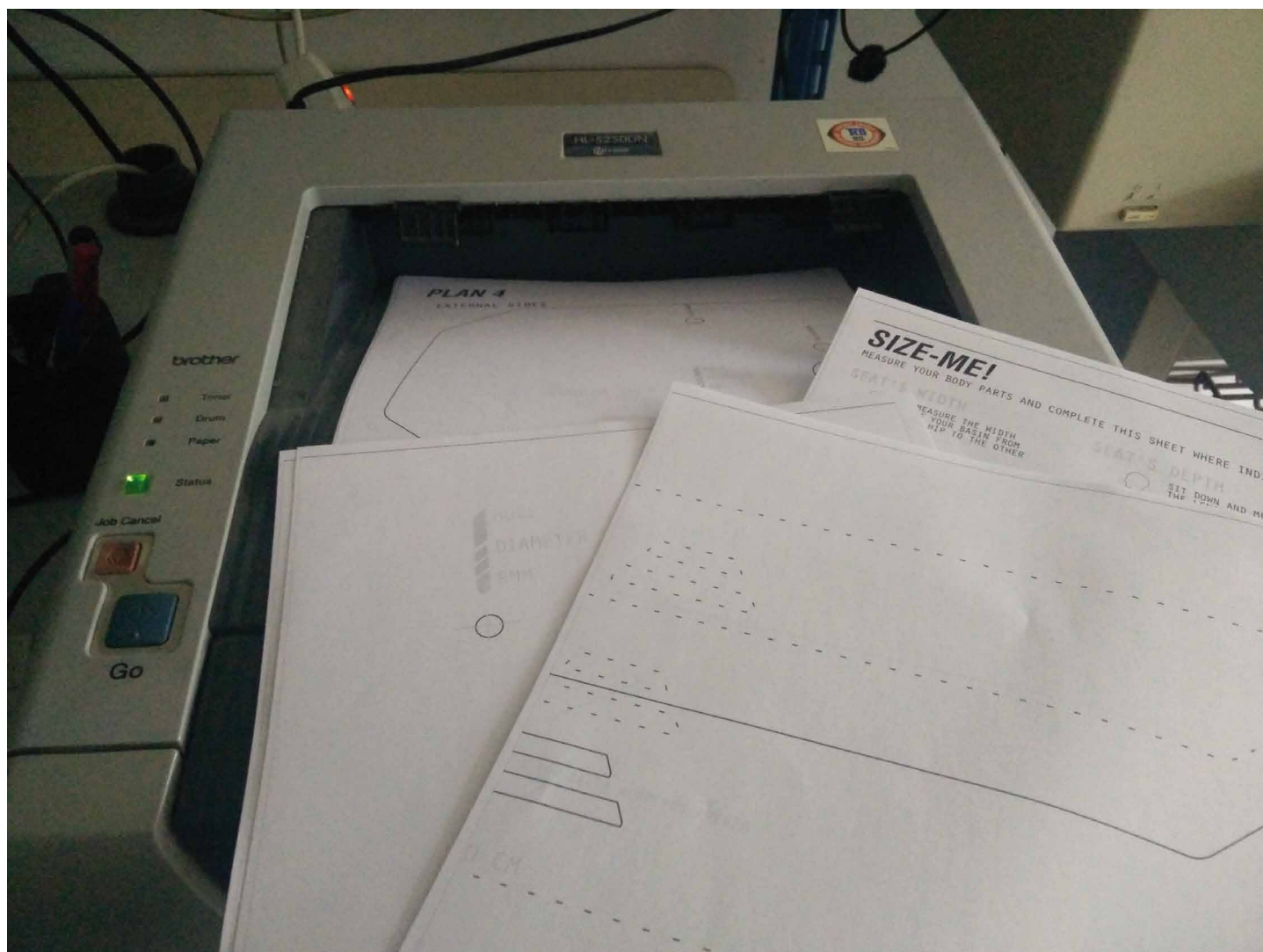
ON [WWW.TOOWHEELS.ORG](http://WWW.TOOWHEELS.ORG)



# *print the TW project sheets*

## 1.1

PRINT THE PROJECT MANUAL WITH ISO A4 PAPER. PRINT AT 100%,  
NOT FIT BORDER TO PAGES OR THE DRAW'S DIMENSIONS  
WILL NOT MATCH !

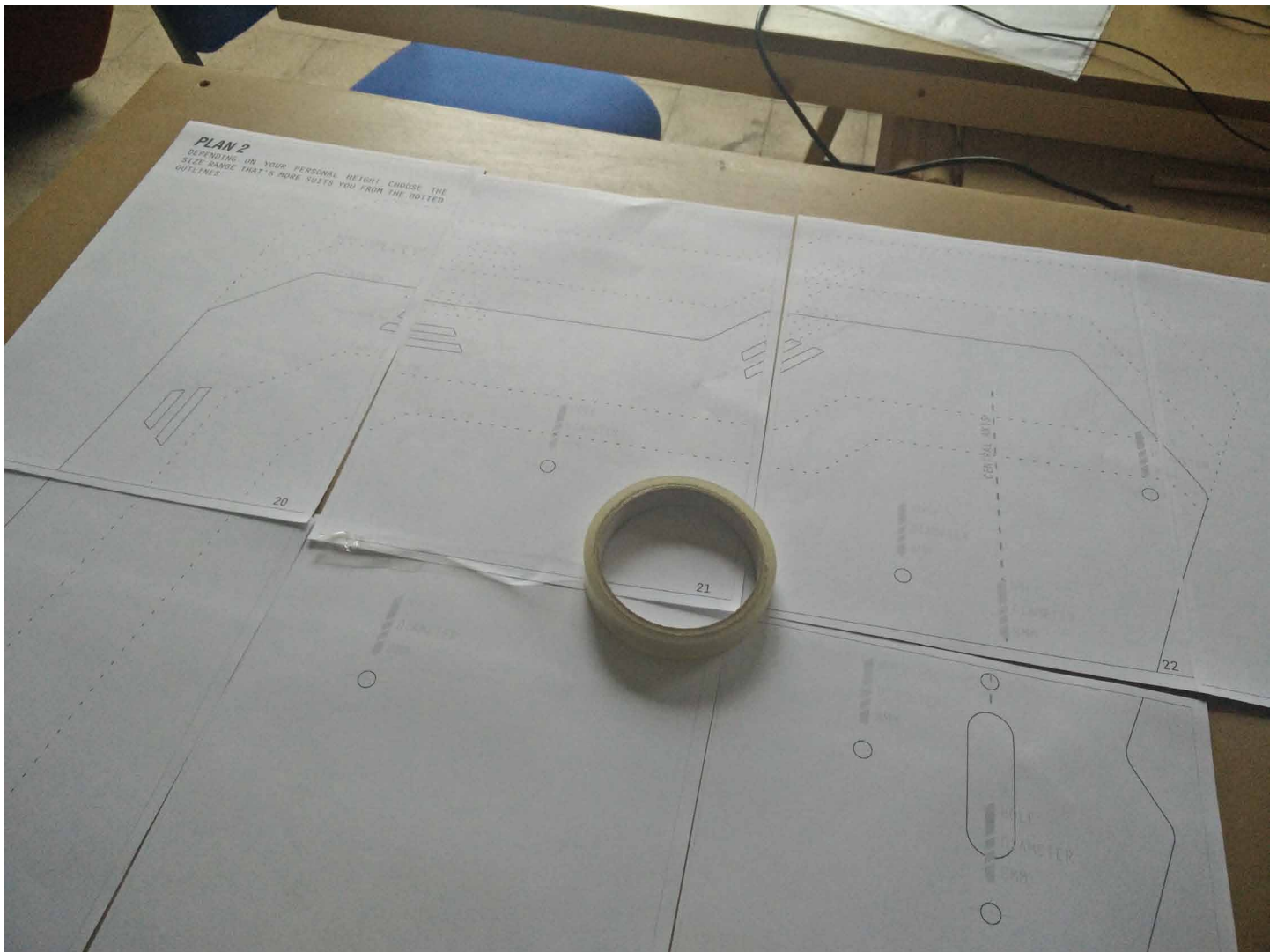




# *assembling the sheets*

## 1.2

USE SCOTCH TAPE TO FIX THE PLANS SHEETS TOGETHER, AS SHOWN IN THE IN SCHEME IN ORDER TO HAVE THE CONTINUOUS OUTLINE OF THE DRAWINGS, AND THE PLANS OF THE WHEELCHAIR.



# *customize your TW project's*

## 1.3

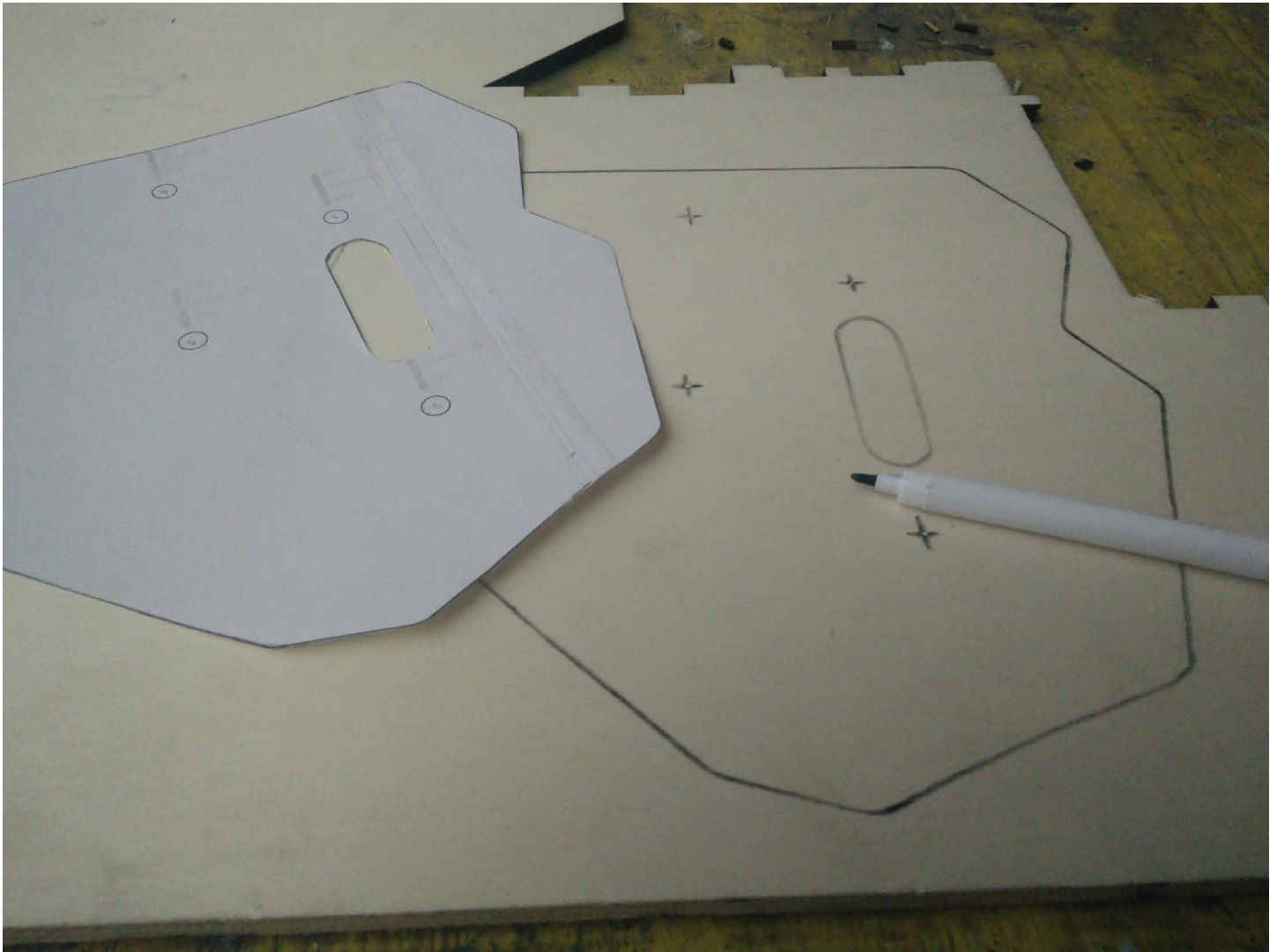
CUSTOMIZE YOUR TW PROJECT'S DIMENTION AND SHAPES: MEASURE YOUR BODY PARTS AND COMPLETE THE "SIZE ME" SHEET. CALCULATE THE SIZE OF COMPONENTS AS EXPLAINED IN THE PLANS SHEETS. EVENTUALLY, USE CARDBOARD TO CUT A FIRST RELEASE OF THE COMPONENTS IN ORDER TO CECK THEIR DIMENSION.



# *cut the paper plans*

## 1.4 & 1.5

CUT THE PAPER PATTERN AND PUT ON THE PLYWOOD SHEETS, EVENTUALLY FIX THEM WITH TAPE OR DRAWING PINS. SIGN UP OUTLINES AND HOLES WITH A PENCIL.

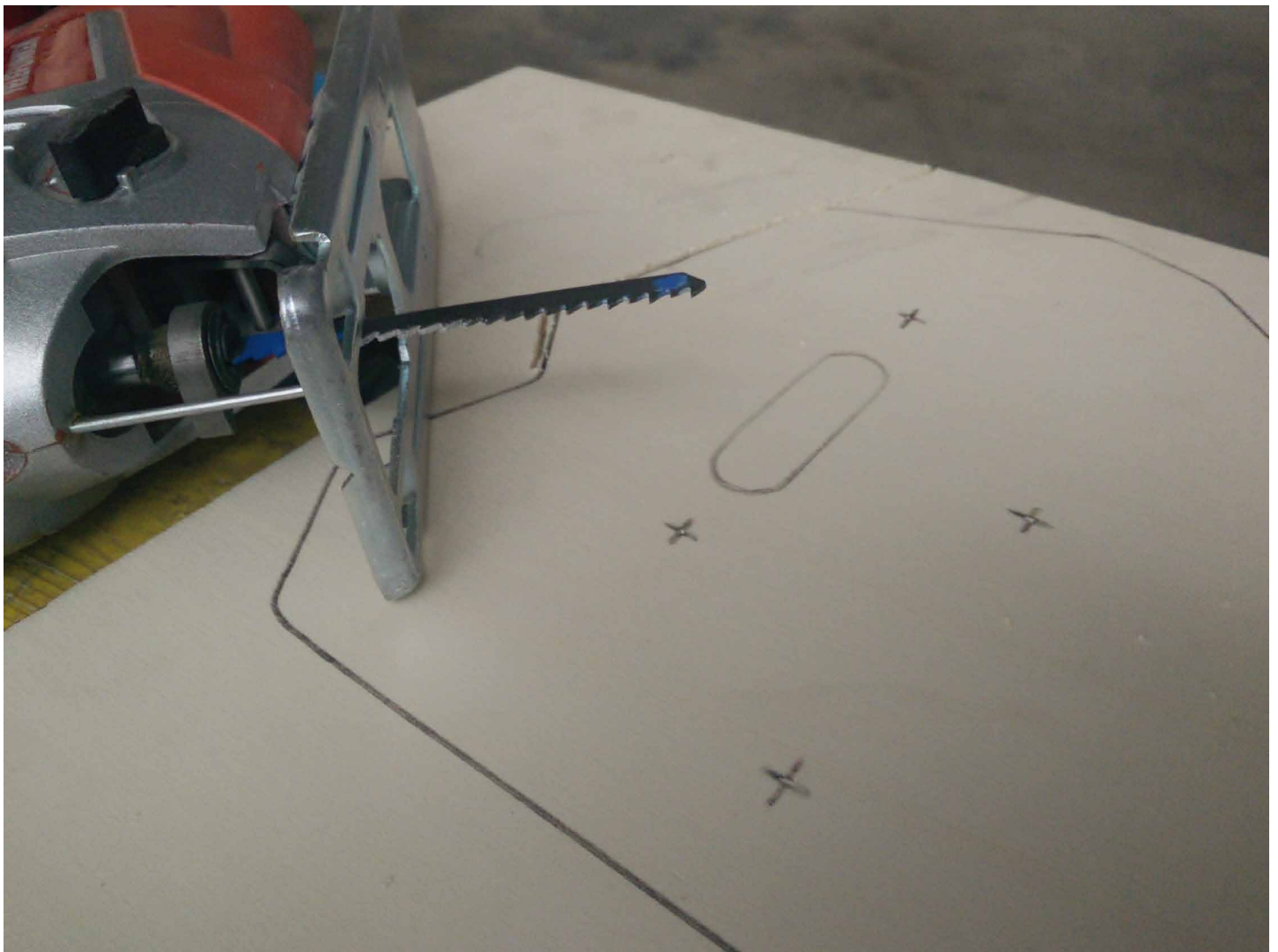




# *cut the plywood sheets*

## 1.6 & 1.7

START CUTTING AND DRILLING ALL THE PARTS. SMOOTH ALL THE BORDER AND CUTTED PIECES!



# *cut the pipes*

## 2.1

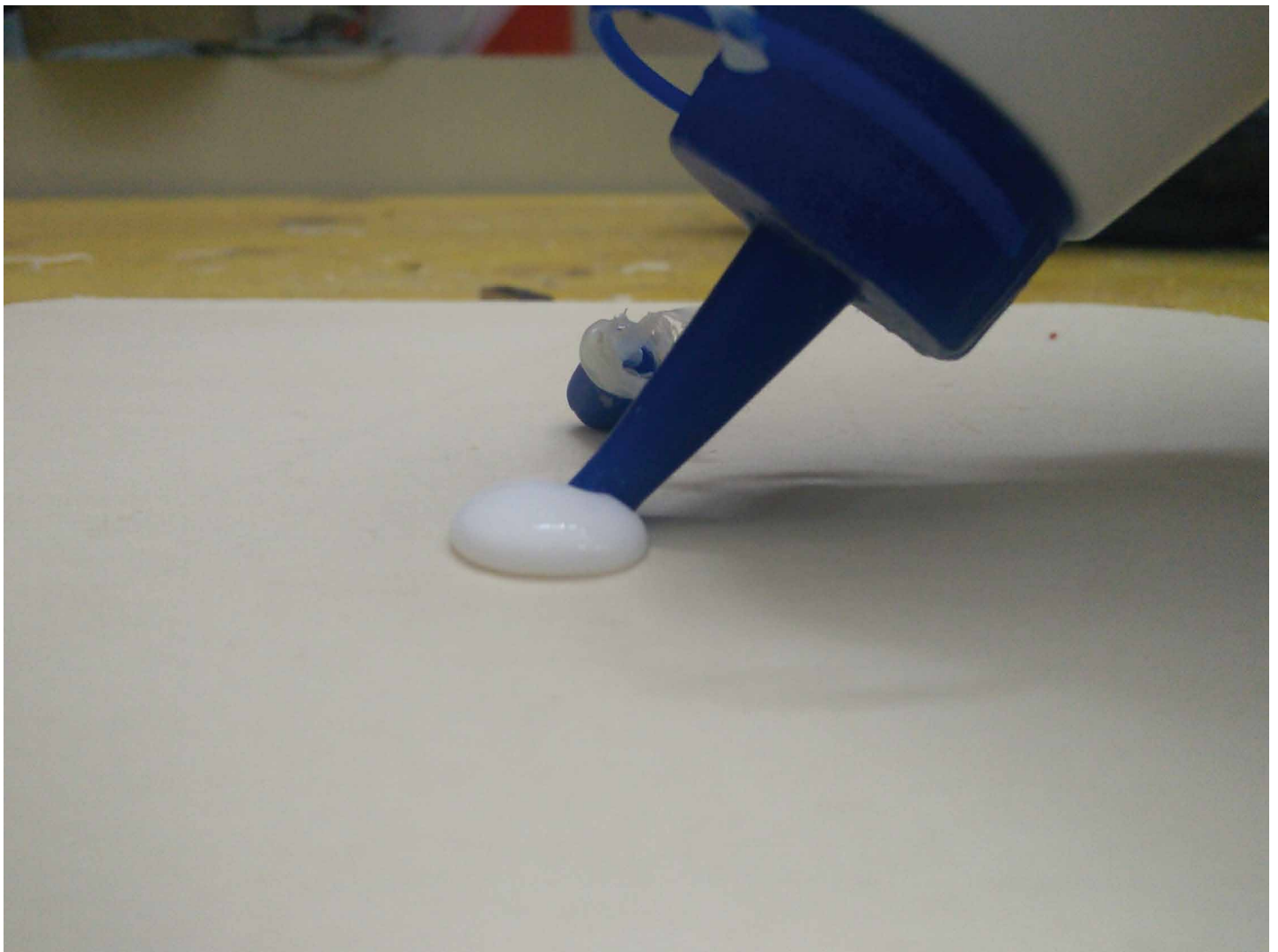
CUT THE ALUMINIUM PIPES USING PIPE-CUTTER OR AN ANGLE GRINDER. CUT THE DIFFERENT LENGTH AS SUGGEST BY THE “CUT PIPE” SHEET’S OF THE PROJECT MANUAL!



# *glue the plywood parts*

## 2.2

GLUE ALL THE PART AS SHOWN IN THE SCHEME, BE CAREFUL IN INTERNAL AND EXTERNAL PANELS AND SIDES!





# *cut the hub's flange*

## 2.3

FROM YOUR METAL SHEET, CUT THE FLANGE USING THE PLANS ON THE MANUAL: CUT THE PAPER OUTLINE, FIX ON THE METAL SHEET AND MARK THE OUTLINE AND HOLES. DRILL AND CUT, AND REMEMBER TO SMOOTH ALL THE SURFACE! YOU HAVE TO BE SURE TO MAKE IN THE FLANGES THE SAME NUMBER OF HOLES YOU NEED FOR THE WHEELS SPOKES!





# *cut and hole the wedge for the axle*

## 2.4

FROM YOUR WOOD BEAM CUT AN ANGULATED SLICE. THE ANGLE YOU CHOOSE BECOME THE ANGLE FOR YOUR WHEELS DISHING.



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# *cut foam foil*

## 3.1

FIND A FOAM SHEET, AND CUT SOME PIECES TO COVER SEAT AND BACKREST, AND IF YOU WANT ALSO THE LATERAL SIDES.





# *paint plywood*

## 3.2

FOR AN EXTRA FINISHING AND DURATION, PAINT YOU WOODEN PARTS TO PROTECT THEM FROM WATER AND HUMIDITY.



# *assemble the hub*

## 3.3

FOLLOW THE HUB'S PROJECT SCHEME TO ASSEMBLING THE BEARING WITH ALL THE PIPES AND THE HUB'S FLANGES.





# *assemble the wheels spokes*

## 3.4

ASSEMBLING YOUR HUB WITH THE BICYCLE WHEELS. IT'S NOT EASY TO FIX THE SPOKES IN THE RIGHT POSITION, ASK TO SOMEONE EXPERT IN BICYCLE'S REPAIR OR CHECK SOME TUTORIAL ON THE WEB!



# *assemble and fix all the parts!*

## 4.1

ASSEMBLE ALL THE PLYWOOD LAYER AND FIX THE THREADED RODS USING NUTS AND WASHERS. BE CAREFUL TO SCREW TIGHT ALL PARTS!



# *cut the excess part of threaded rods*

## 4.2

CUT THE EXCESS PART OF THE THREADED RODS.





## 4.3

FIX THE FOAM USING GLUE OR SOME TAPE. IF YOU NEED YOU CAN FIX SOME BELTS AT THE WHEELCHAIR FOR A MORE COMFORTABLE USE.





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# *let's play!*

## 4.4

ENJOY YOUR TOOWHEELS!  
IMPROVE YOUR WHEELCHAIR ADDING STUFF AND DEVELOP  
YOUR OWN SET UP, EVEN CREATING WHEELCHAIR FOR DIFFE-  
RENT ACTIVITY!

