

WWW.TOOWHEELS.ORG

## ASSEMBLING SCHEMES

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!

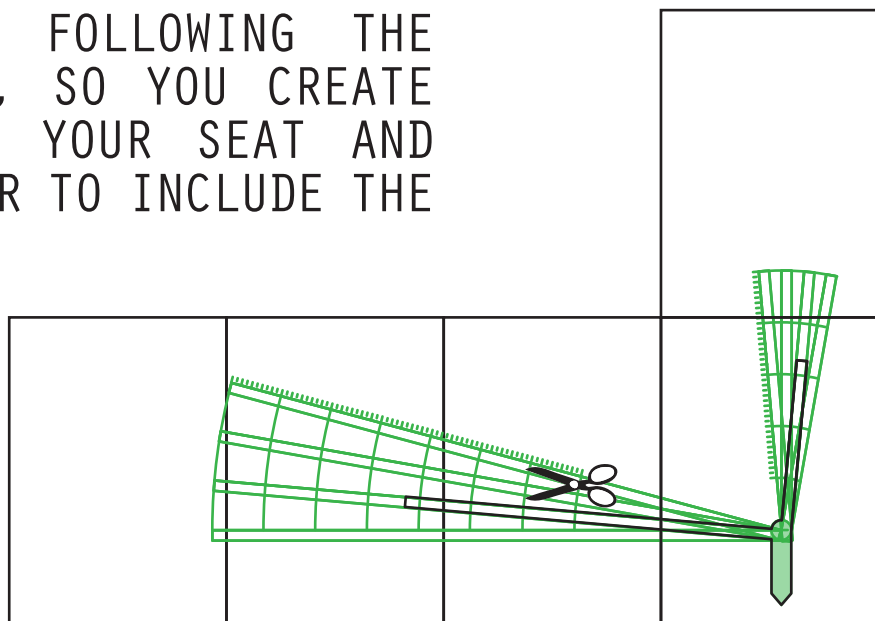
TOOWHEELS IS A PATENT PENDING PROJECT,  
RELEASED IN OPEN SOURCE VERSION (CC licence NON COMMERCIAL, SHARE ALIKE) TO BE USEFULL FOR PEOPLE ALL OVER THE WORLD. MAKE IT FOR YOUR FRIENDS, FOR PEOPLE OF YOUR CITY, MAKE IT IN A FABLAB OR A MAKERSPACE OR AT HOME!!

MAKE IT AND ENJOY!

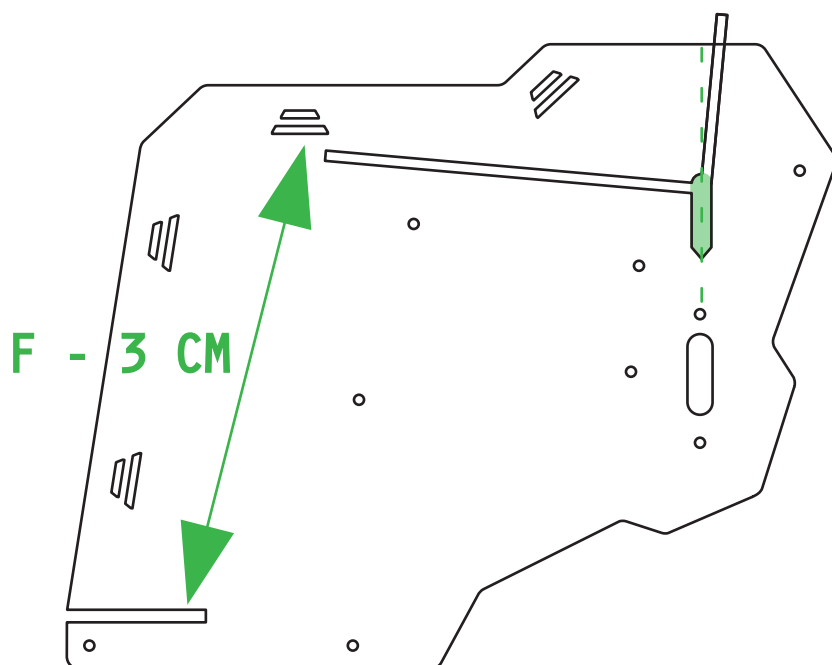
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# POSIZIONA LA SEDUTA

- 1 CUT THE PAPERS FOLLOWING THE LINE YOU MARKED, SO YOU CREATE THE POSITION OF YOUR SEAT AND BACKREST. REMEMBER TO INCLUDE THE GREEN ARROW!



- 2 FIX THE PAPER SCHEME ON THE WHEELCHAIR SIDE: WITH THE FRONT PART AD THE **F-3CM** DISTANCE FROM THE FOOT SUPPORT. MOVE THE SCHEME IN ORDET TO HAVE THE GREEN ARROW AT THE SAME AXES OF THE WHEELCHAIRS HUB'S HOLES

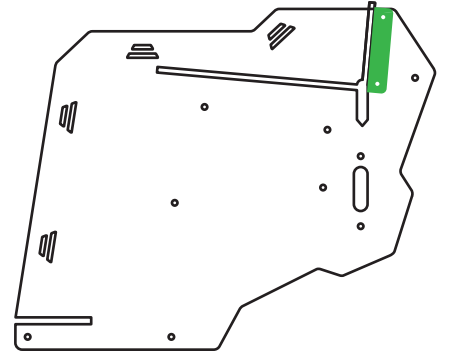


- 3 GLUE THE PAPER SCHEME AS SHOWN IN THIS PICTURE: IT HELPS YOU TO FIND THE RIGHT POSITION OF YOUR SEAT AND BACKREST

# ***BACKREST, SEAT, BUMPER SUPPORT***

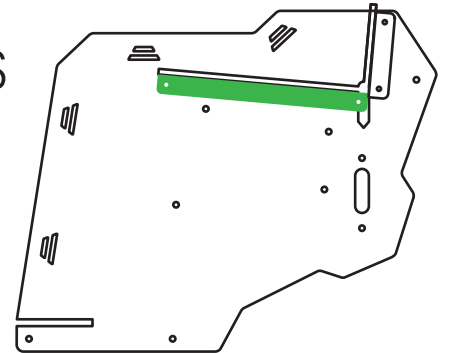
**1** CUT THE BACKREST SUPPORT AT THE SAME HEIGHT **C** OF YOUR BECKREST

**2** GLUE THE BACKREST-SUPPORT UNDER THE PAPER SCHEME YOU FIXED PREVIOUSLY



**3** CUT THE SEAT SUPPORT OF THIS LENGTH: **B-10CM**

**4** GLUE THE SEAT-SUPPORT UNDER THE PAPER SCHEME YOU FIXED PREVIOUSLY

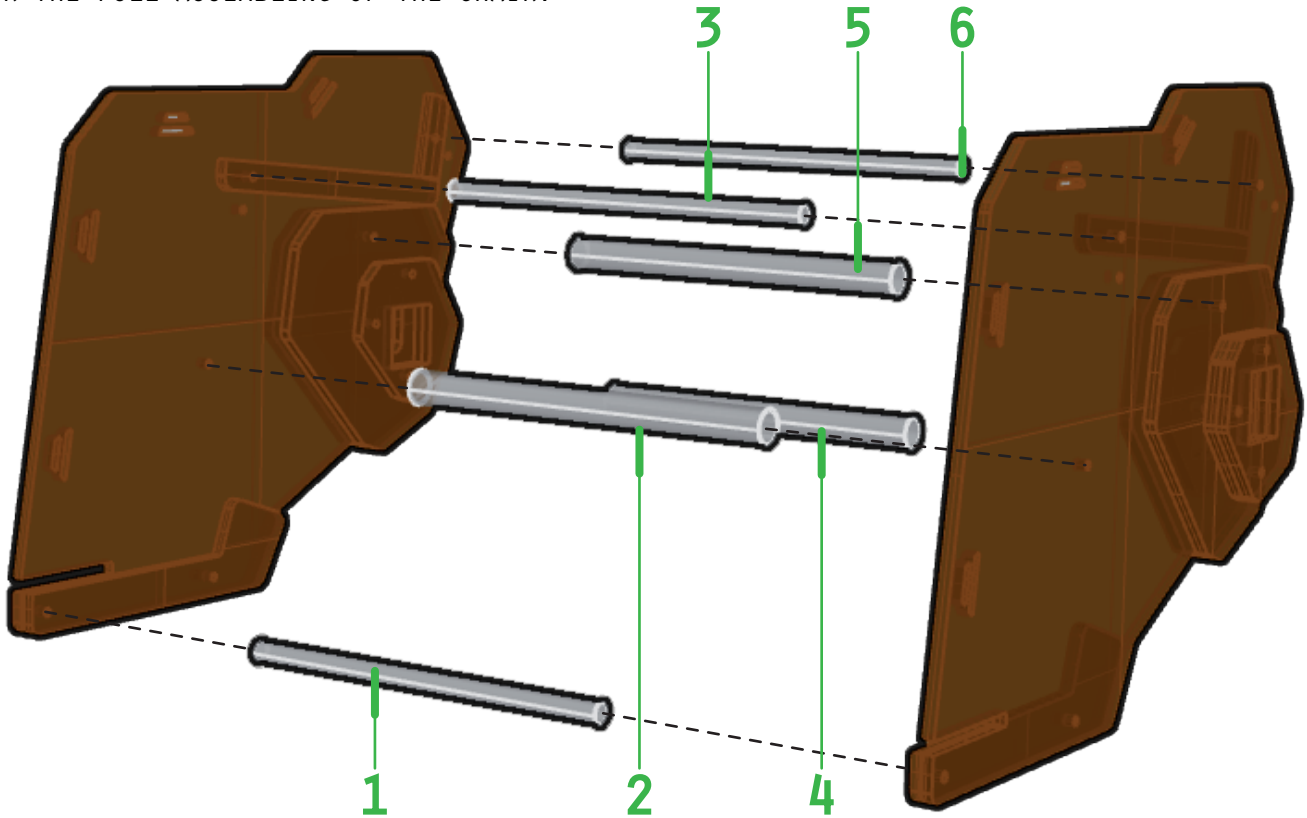


**5** CUT THE FOOT HOLDER AND THE OTHER PARTS, AND FIX ALL TOGETHER WITH THE CHAIR

# PIPES AND RODS

## CROSSING PIPES

CROSSING PIPES GIVE RIGIDITY TO THE WHOLE STRUCTURE. AT EACH SIDE OF THE PIPE, PLACE A WASHER WITH AT LEAST THE SAME DIAMETER OF THE PIPE (BETTER IF IT'S MORE). THE WASHERS ABSORB THE PIPE PRESSURE ON THE WOOD AND DIVIDE THE FORCE ON A LARGER SURFACE. EACH PIPES AND RODS HAS A DIFFERENT LENGHT, IF YOU WANT TO BE SURE OF YOUR WORK CUT OF THE EXTRA PARTS OF THE RODS AFTER THE FULL ASSEMBLING OF THE CHAIR!



**1** USE MEASURE **A - 2CM**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

**2** USE MEASURE **A**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

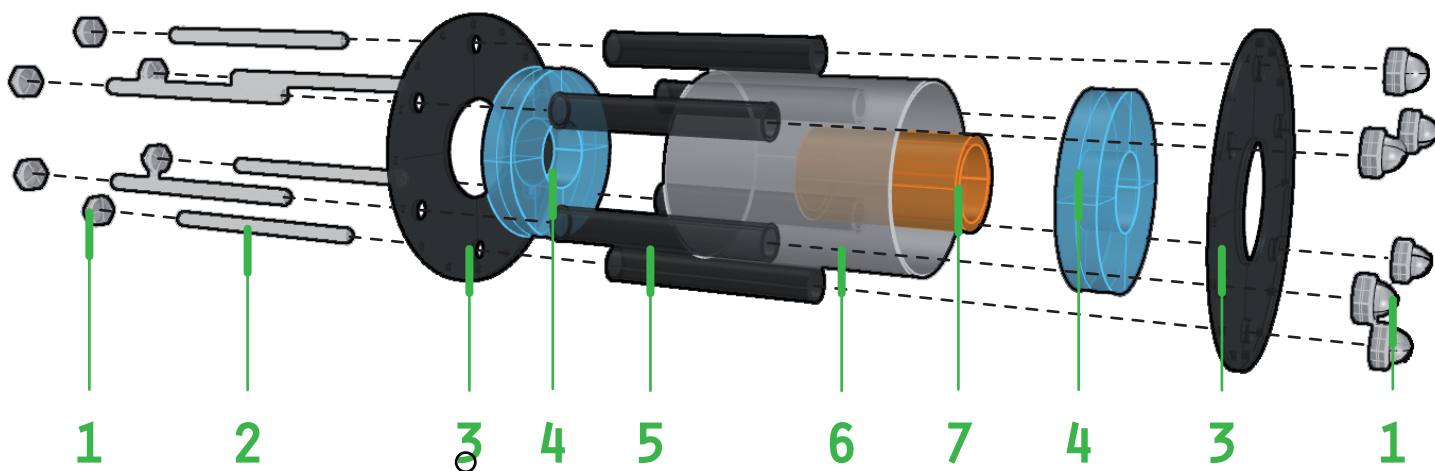
**3** USE MEASURE **A**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

**4** USE MEASURE **A - 6CM**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

**5** USE MEASURE **A - 4CM**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

**6** USE MEASURE **A**: BE CAREFUL IN SUBTRACTING ALSO THE WIDTH OF THE WASHERS, ONE OF EACH SIDE OF THE PIPE

# HUB



## 1 NUTS M8 DIAMETER - LOCK WITH THREAD LOCKER

THE NUTS SCREWED AT THE SIDE OF THE ROD LOCKED THE STRUCTURE. FOR EXTRA RESISTANCE, USE THREAD LOCKER LIQUID, AND FOR EXTRA FINISHING USE ACROD NUTO TO CLOSE THE RODS.

## 2 THREAD RODS M8 DIAMETER

THE RODS PUT THE FLANGES TOGETHER IN COMPRESSION.

## 3 FLANGE MAKE WITH IRON SHEET 1.25MM, EXTERNAL DIAMETER 79MM, INTERNAL 30MM.

THE FLANGE LOCK BEARINGS, RODS, SPOKES IN ONE PIECE.

## 4 BEARING EXTERNAL DIAMETER 42MM, INTERNAL 20 MM

IS IMPORTANT TO LET THE WHEELS RUN FAST!

## 5 ALLUMINIUM PIPES 6 PIECES, DIAMETER EXTERNAL 10MM, INTERNAL 6, LENGTH 65MM

THE PIPES ENCLOSE THE CORE OF THE HUB WITH THE BEARINGS, AND KEEP THE FLANGES PARALLEL.

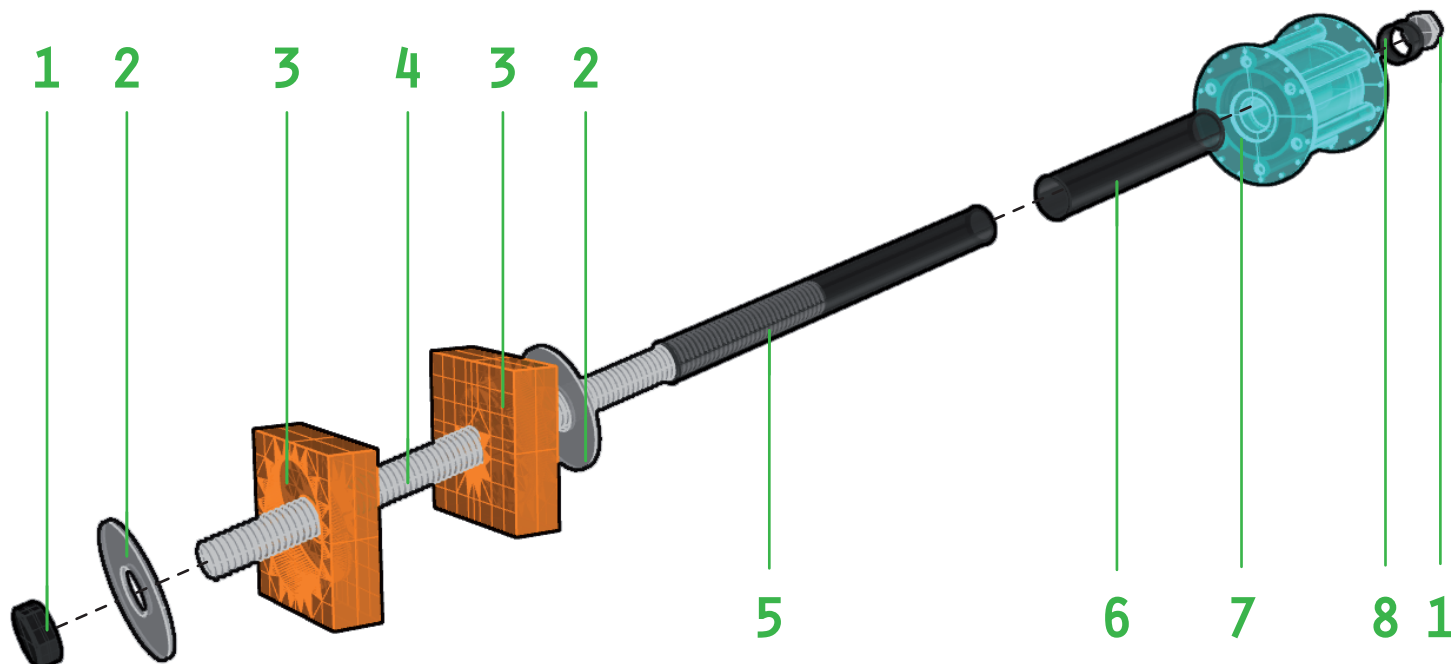
## 6 ALLUMINIUM PIPE ONE PIECE, EXTERNAL 45MM, INTERNAL 42MM, LENGTH 65MM

THE CENTRAL PIPE LOCK THE BEARINGS

## 7 NYLON PIPE EXTERNAL DIAMETER 26MM, INTERNAL 20MM, LENGTH 65MM

LET THE BEARINGS AT THE RIGHT DISTANCE INSIDE THE CENTRAL PIPE

# AXLE



## 1 SELF LOCKING NUTS M16

ARE FIXED AT THE EXTERNAL SIDE OF THE RODS, AND LOCK ALL THE STRUCTURE

## 2 WASHERS EXTERNAL DIAMETER 56MM, INTERNAL 20MM

DISTRIBUISCE LE FORZE IN PROSSIMITÀ DEL CUNEO AUMENTANDO LA SUPERFICIE SOTTOPOSTA A COMPRESSIONE

## 3 WEDGE

IT'S THE ELEMENT THAT GIVE AT THE AXLE THE ANGLE WITH THE STRUCTURE OF THE WHEELCHAIR, CREATING THE WHEEL DISHING.

## 4 THREADED ROD M16

IT'S THE INNER SIDE OF THE AXLE THAT RESIST AT ALL THE STRESS AND FORCES

## 5 ALLUMINIUM PIPE INTERNAL DIAMETER 16MM, ESTERNAL 20MM

AGISCE DA ANIMA DEL MOZZO, SUL QUALE SI APPOGGIANO I CUSCINETTI PER TRASFORMARE L'ATTRITO RADENTE IN VOLVENTE.

## 6 ALLUMINIUM PIPE EXTERNAL DIAMETER 24MM, INTERNAL 20MM

GIVE THE CORRECT DISTANCE BETWEEN THE WEDGE AND THE HUB

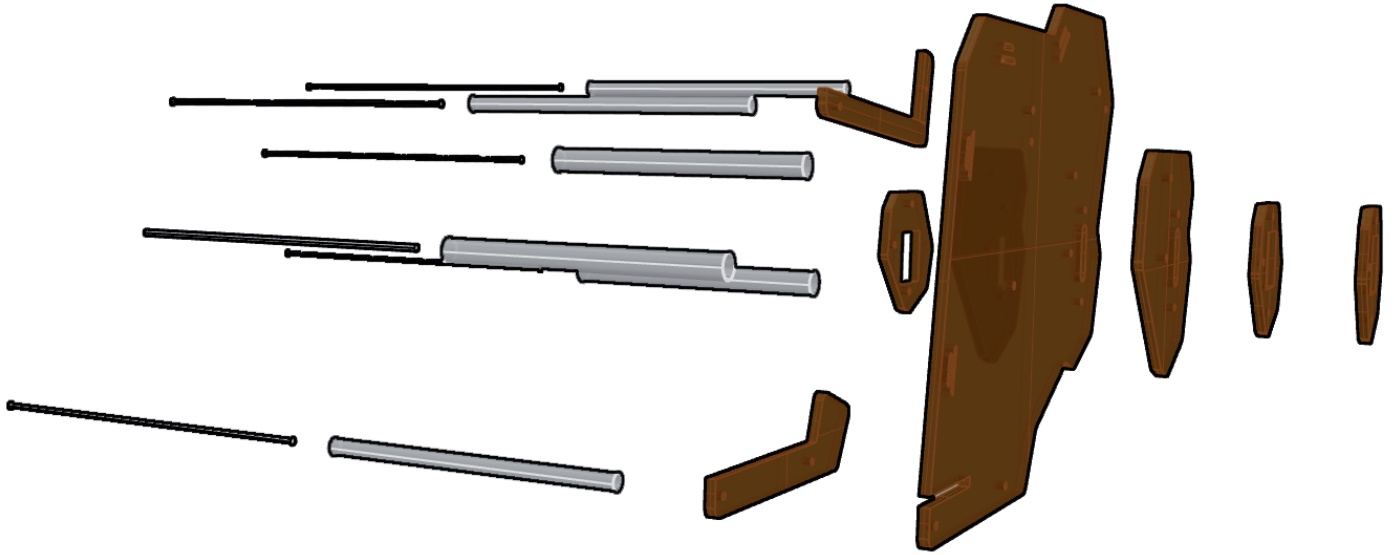
## 7 HUB

## 8 ALLUMINIUM PIPE EXTERNAL DIAMETER 24MM, INTERNAL 20MM, LENGHT 10MM

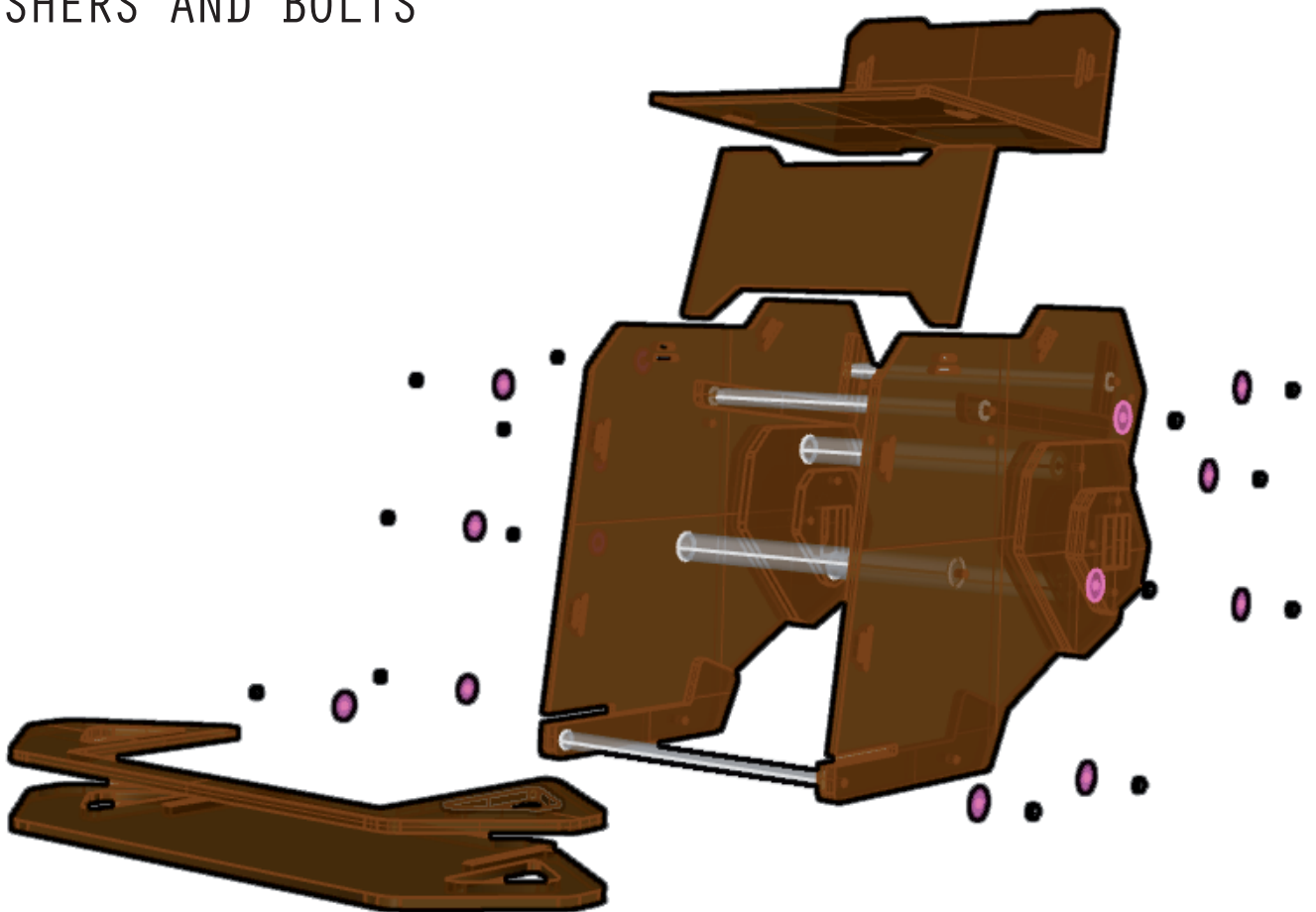
GIVE THE CORRECT DISTANCE BETWEEN THE HUB AND THE NUTS

# FINAL ASSEMBLING

**1** INSERT THE THREADED RODS INSIDE THE PIPES, AND INSERT A WASHERS (32 X 8 MM) AT EACH SIDE OF THE PIPE



**2** INSERT AT BOTH THE END OF THE THREADED RODS THE WOODEN SIDE OF THE WHEELCHAIR, AND LOCK THEM WITH WASHERS AND BOLTS

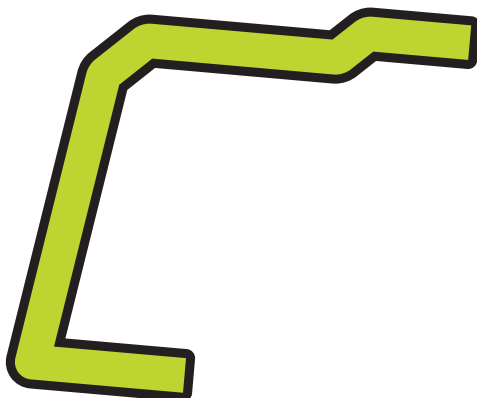


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# **FINISH !**

**3** INSERT THE AXLES AND THE HUBS, ED FIX ALL TOGETHER WITH NUTS AND BOLTS !

**ENJOY !**



TOOWHEELS DI FABRIZIO ALESSIO È DISTRIBUITO CON LICENZA CREATIVE COMMONS ATTRIBUZIONE  
- NON COMMERCIALE - CONDIVIDI ALLO STESSO MODO 3.0 UNPORTED CONDIVIDI USANDO QUESTA  
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