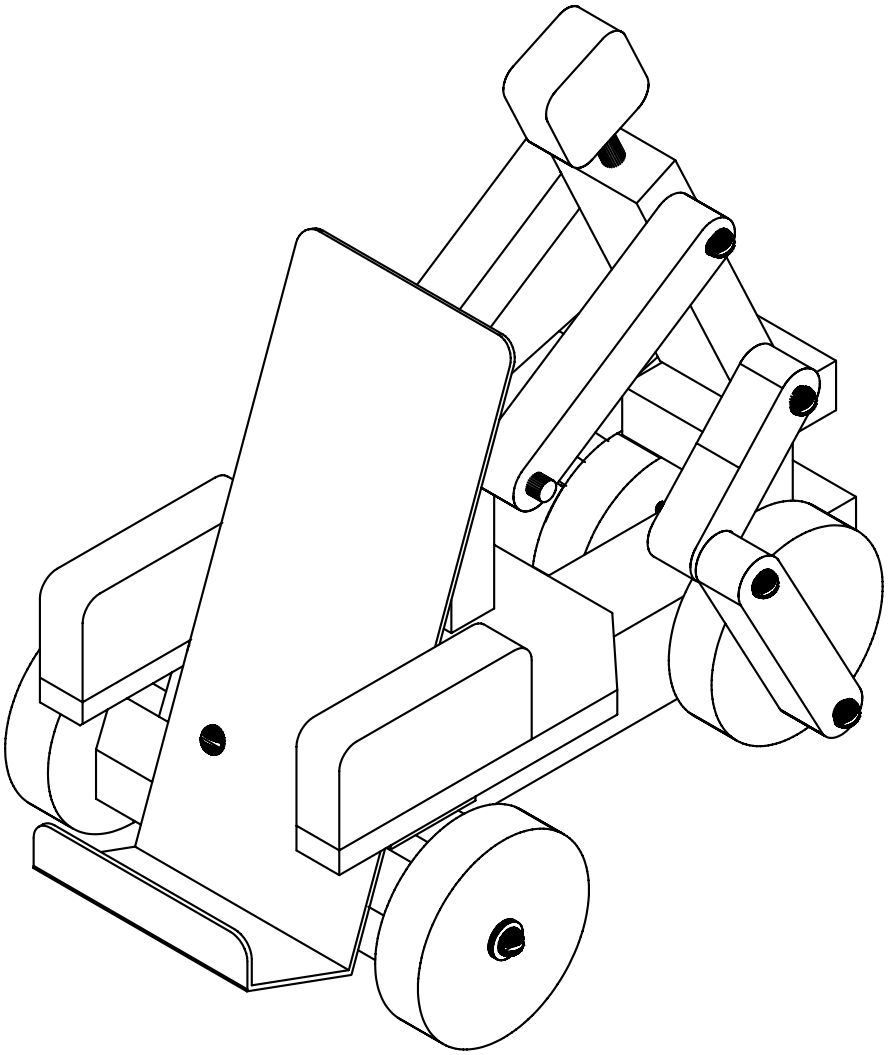
1 0 6 . 2 3 4

Rickshaw, mobile phone holder



Please Note

The OPITEC range of projects is not primarily intended as toys for young children. It is for teaching, designing and making to ensure that pupils experience a range of tools and processes.

1. Product Information:

Article: Mechanical craft project

Use: Suitable for age 12 years plus

2. Material Information:

2.1 Material: Pine (Conifer), softwood
Beech (Deciduous), hardwood
Wood should be relatively dry before working;

Working: The wooden parts must be sawn, drilled, shaped and sanded
Mark out according to plans or use the patterns provided;

Joining: Use PVA white glue
Screws

Finish: Wax (liquid or solid)
Clear varnish
Wood stain (Use colour and then varnish)
Linseed oil

2.2. Material: Aluminium sheet
Light, durable and easy to form;

Working: Filing, drilling and forming;

Joining: Nuts and bolts;

Finish: No special finish needed

3. Tools:

sägen: Use a fine toothed saw for cutting dowel;

Note! Hold the work in a vice!

Use a fretsaw for curves and rounded shapes;

Note! Fretsaw blades are inserted from underneath in the frame with the teeth facing forward!

Use a fretsaw board to hold the work and saw in slow steady strokes turning the work as you go;

Shaping: Use a suitable grade of wood file or glass paper
For making slots use needle files;

Note! Files only cut on the forward stroke!

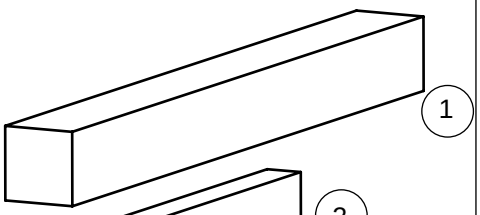
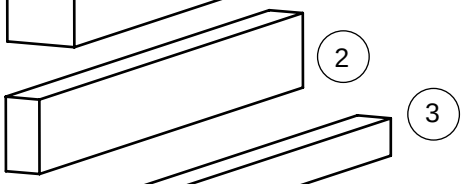
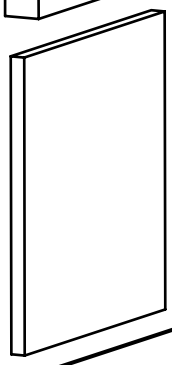
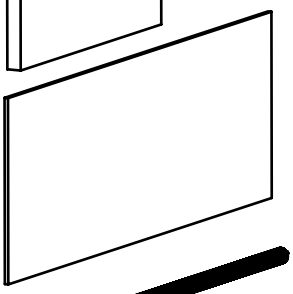
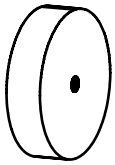
Sanding: Use a block on flat surfaces and loose sheet on curves etc;

Drills: Use a pillar drill and a hand vice when drilling holes;

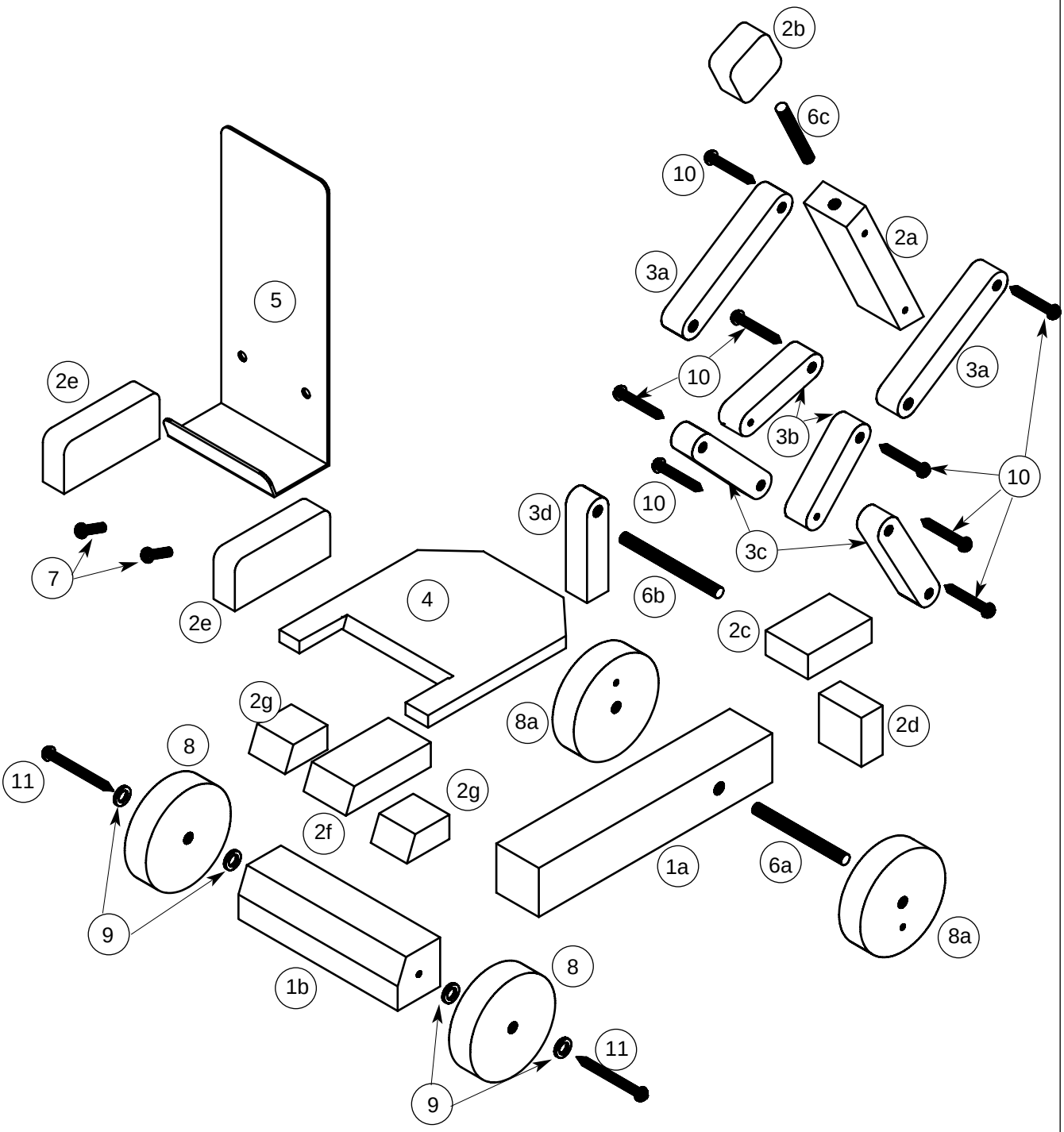
Note! Please adhere to the safety procedure when drilling
Do not wear rings, loose jewellery etc Tie long hair back.
Wear safety glasses and an apron. Hold the work in a machine vice.

Clamping: Use woodworking clamps to hold the parts whilst glue is drying (Do not over tighten them or they will leave marks)
Use a woodworking or a metal work vice with soft jaws to protect your project when working.

4. Parts list:

Part	Material	Quantity	Size	Diagram
Chassis	Pine strip	1	20 x 20 x 200 mm	
Seat /Arm rest/Re-inforcement Body / head	Pine strip	2	10 x 20 x 150 mm	
Arms / legs	Pine strip	2	10 x 10 x 200 mm	
Base	Plywood	1	4 x 80 x 80 mm	
Seat	Aluminium	1	1 x 50 x 150 mm	
Axle, Neck Steering	Dowel	1	ø4 x 150 mm	
Chipboard screws	Steel	2	3 x 10 mm	
Wheels	Beech	4	ø40 mm	
Washers	Steel	4	3,2 mm	
Screws	Steel	8	3 x 20 mm	
Screws	Steel	2	3 x 30 mm	

5. Exploded diagram:



6. Planning overview

6.1 Making the parts for the seat, figure, re-inforcement and armrest

6.2 Making and assembling the chassis

6.3 Making the seat (Mobile phone holder)

6.4 Making the base

6.5 Mounting the wheels

6.6 Seat arms and rider seat

6.7 Making and assembling the figure

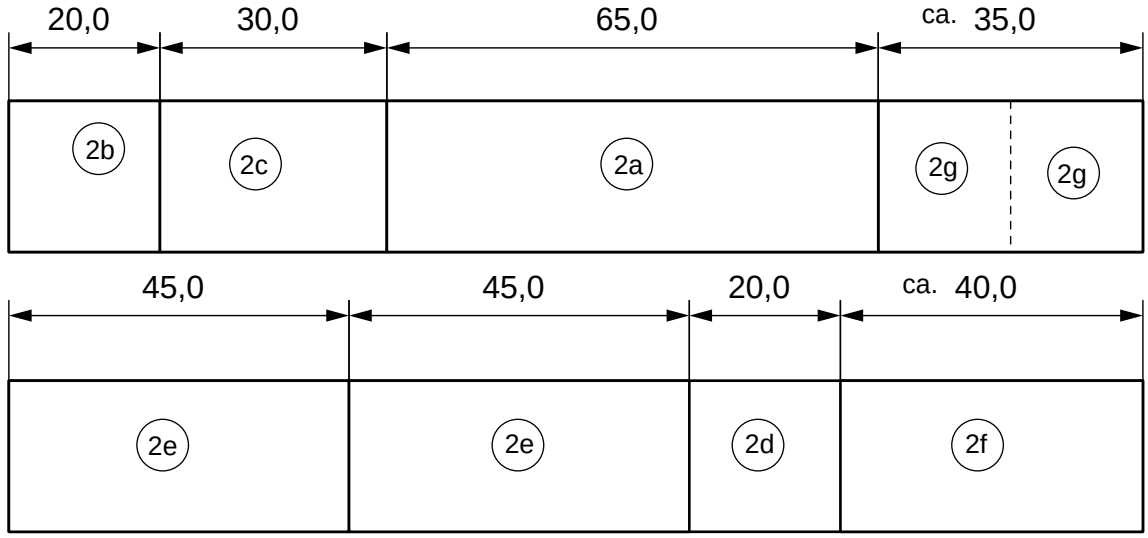
6.8 Mounting the figure on the rickshaw

6.9 End assembly and testing

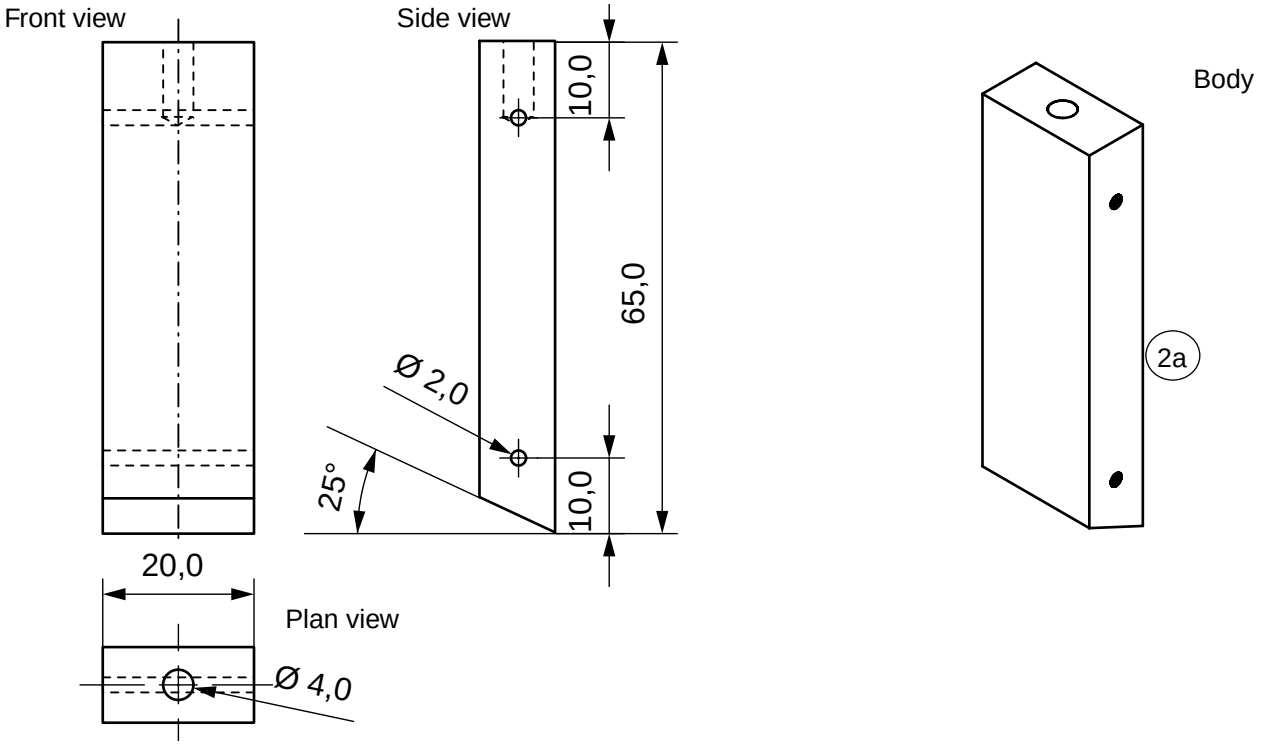
6.1 Making the parts for the seat, figure, re-inforcement and armrest

6.1.1 Kiefernleisten (2) 10 x 20 x 150 mm nach Zeichnung anreißen und Teile ablängen.

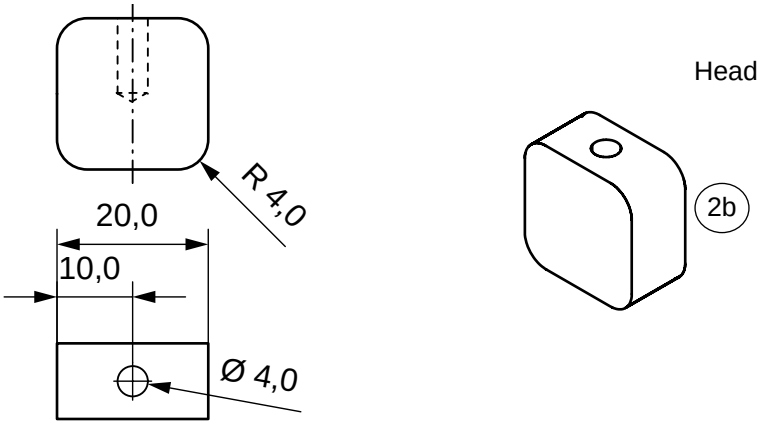
Note: the remaining parts (2g/2f) will be shorter as shown due to the width of the saw cuts!



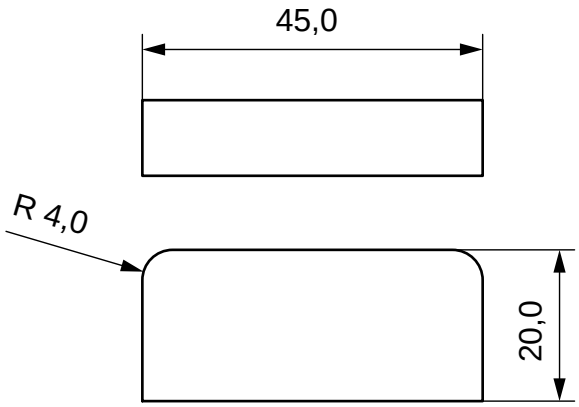
6.1.2 Mark out and saw part (2a) to an angle of 25degress and drill the side holes for the arms and legs as shown. The holes for the legs and arms are drilled all the way through. The hole for the head is a blind hole 10mm deep x 4mm diameter.

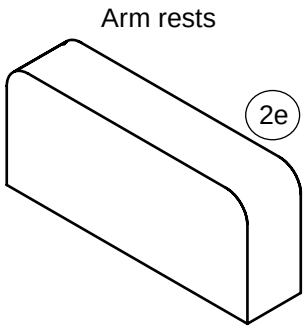


6.1.3 Round off the corners (2b) and drill a blind hole 4mm dia x 10mm deep.



6.1.4 Round off the top corners of pine strip (2e) as shown.



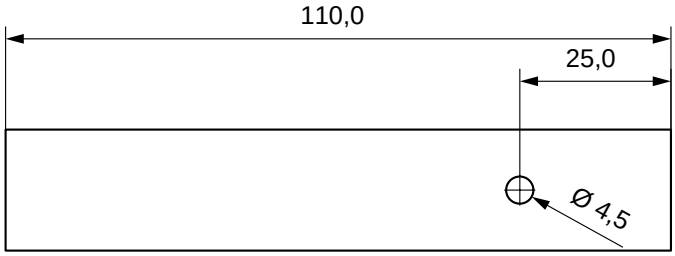


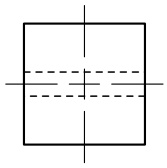
6.1.5 Cut the remaining pine strip(2g) in half

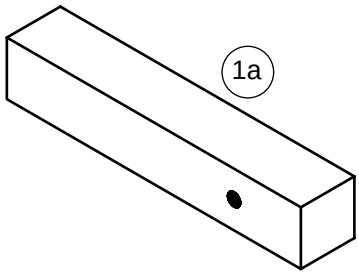
6.1.6 Sand all the parts (2a/2b/2c/2d/2f/2g).

6.2 Making and assembling the chassis

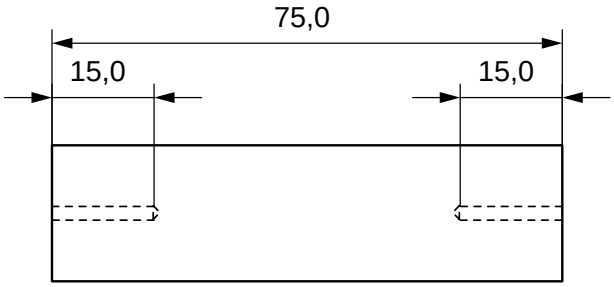
6.2.1 Saw from the pine strip (1) 20 x 20 x 200 apiece part (1a) 110mm long. Mark out and drill the 4.5 mm dia. hole as shown.

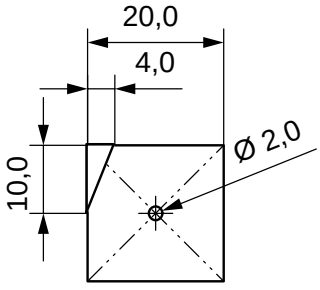


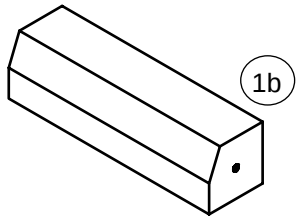




6.2.2 Saw from the pine strip 81) part (1b) which is 70mm long. Drill a blind hole in each end 2mm diameter x 15mm deep
Finally chamfer the edge 4mm wide x 10mm deep as shown (An angle of 20degrees)

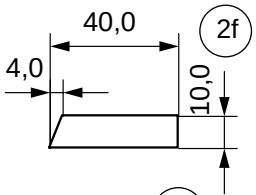


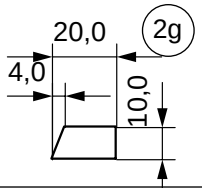


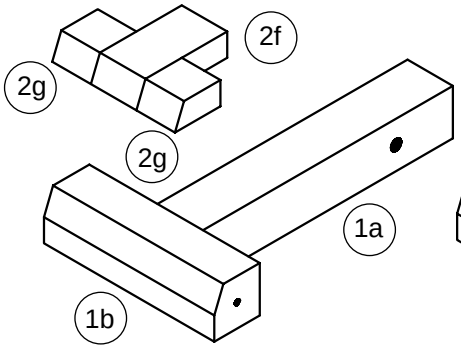


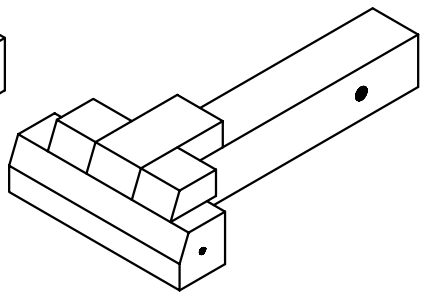
6.2.3 Glue strip (1a) on to (1b) as shown
Chamfer the reinforcement parts (2f +2g) as in part 1b
Finally glue them in place as shown to complete the chassis.

Note: Leave it to dry thoroughly!



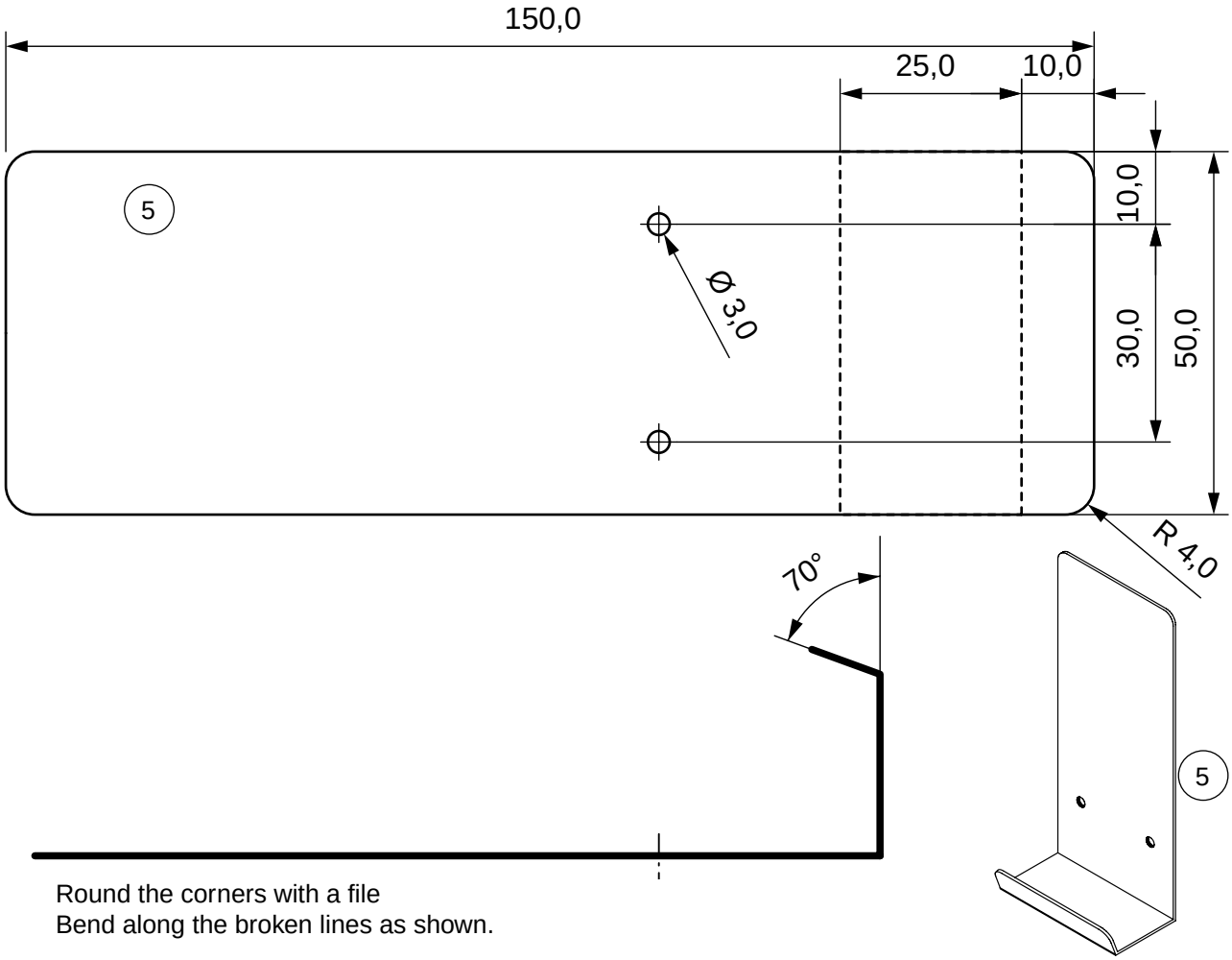






6.3 Making the rickshaw seat (Mobile phone holder)

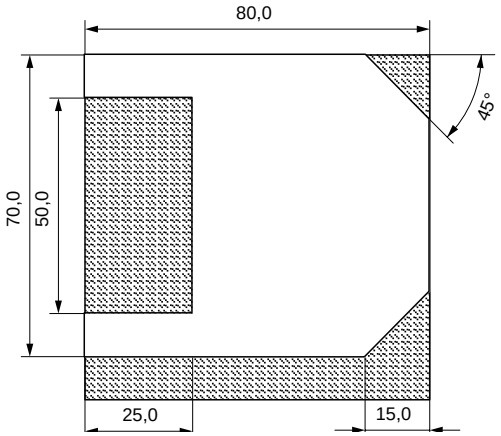
6.3.1 Using the pattern cut out the aluminium sheet (5) 1 x 50 150mm, drill and fold as shown.

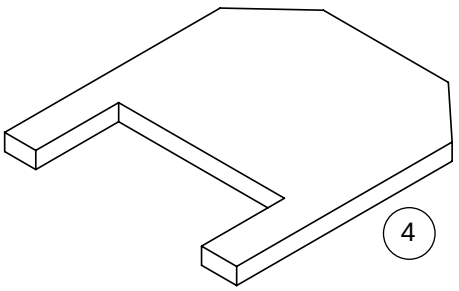


Round the corners with a file
Bend along the broken lines as shown.

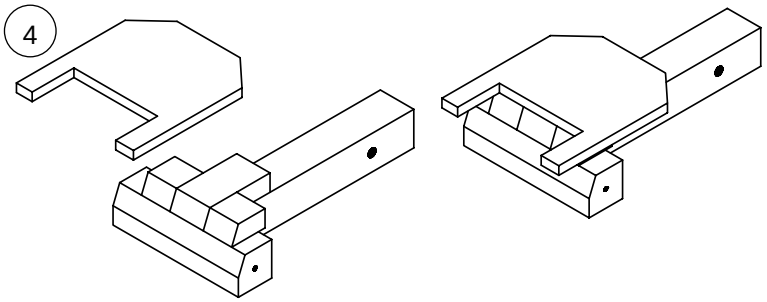
6.4 Making and assembling the base

6.4.1 Mark out the plan of the base on the plywood sheet (4) 4 x 80 x 80mm and saw it out.



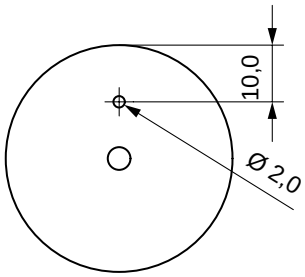


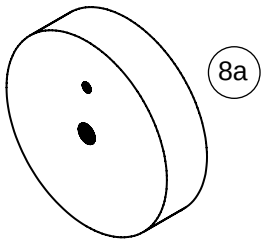
6.4.2 The finished base can now be glued on the chassis. The slot should butt up to the chamfered part on the chassis.



6.5 Drilling and assembling the wheels

6.5.1 Drill two of the wheels (8) through with a 2mm dia hole as shown



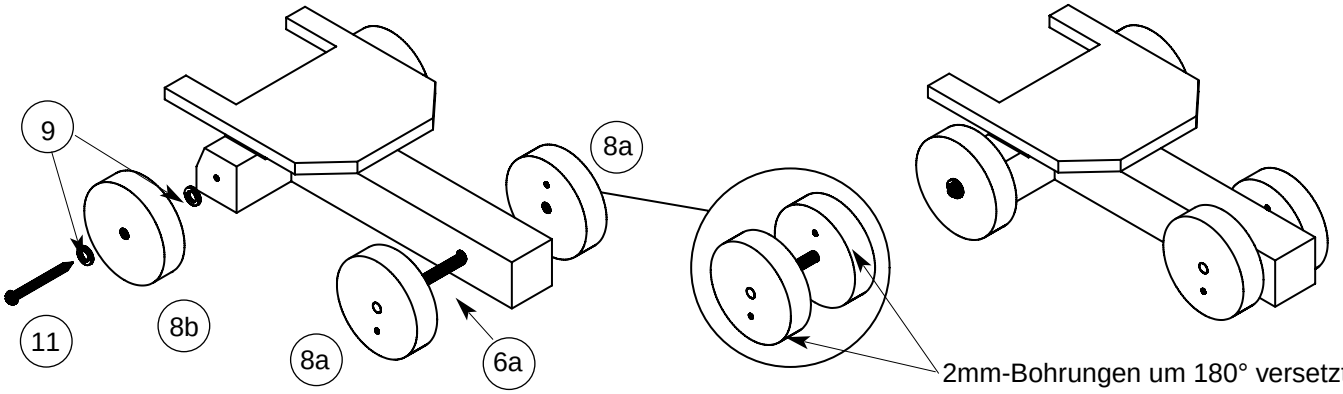


6.5.2 Saw from the dowel (6) a piece (6a) 42mm long

6.5.3 Glue the axle (6a) in the middle hole of a wheel (8a)

6.5.4 Insert the wheel (8a) with axle through the chassis (hole 4.5mm dia) and then add the opposite wheel (8a). Ensure that the 2mm holes in both of the wheels are set at 180 degrees to one another. Glue the wheel in place.

Hinweis: Darauf achten, dass kein Leim in die Bohrung vom Fahrgestell!



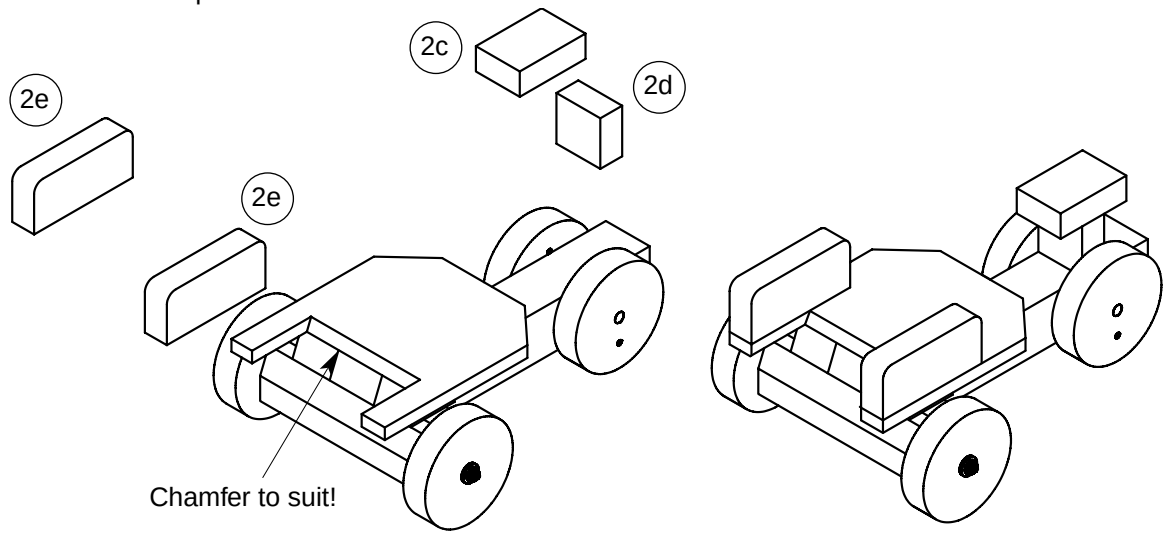
6.5.5 The front wheels (8b) are fixed with screws (11) and washers (9) into the 2mm dia holes in the front part of the chassis (1b) Screw them in so that there is a little play and they spin easily.

6.6 Assembling the rickshaw seat and arms and the drivers seat

6.6.1 Once the glue is dry use a file to chamfer the cut out in the base to run in line with the chamfer on the chassis

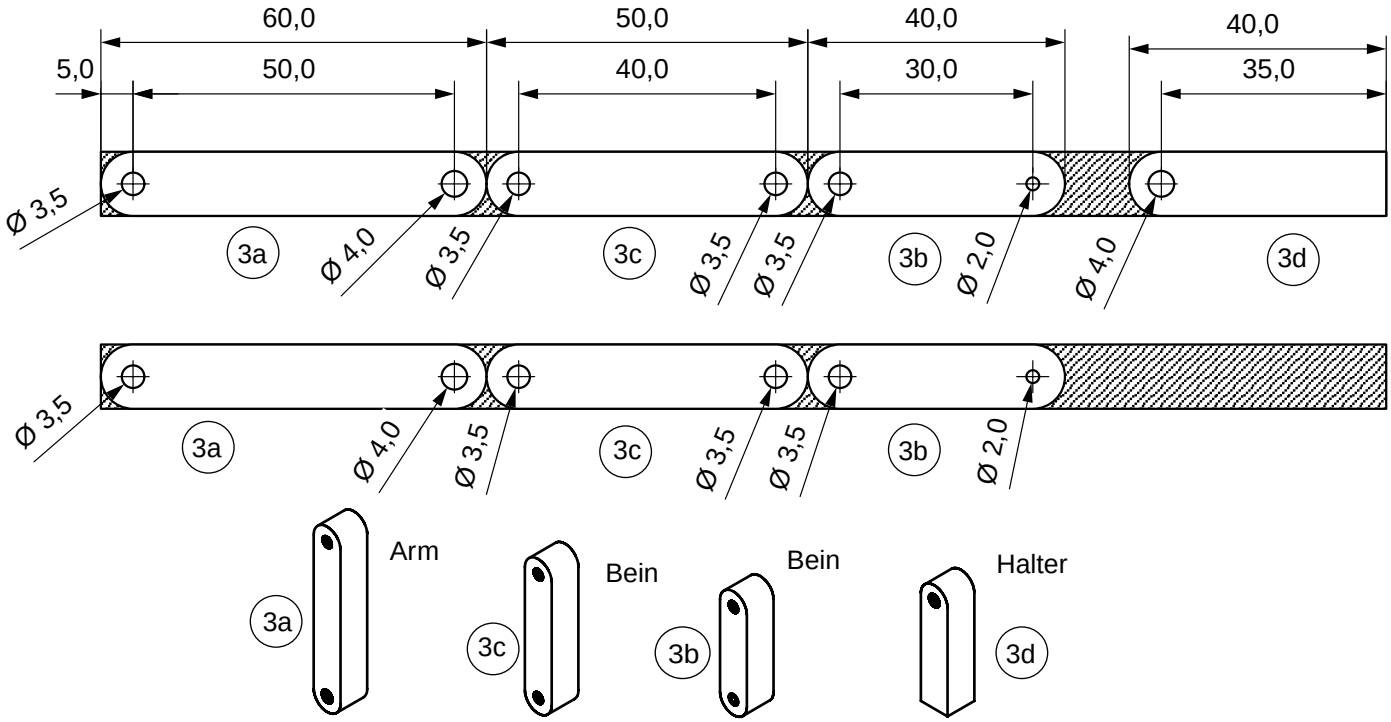
6.6.2 Glue the seat arms (2e) on either side of the base (4).

6.6.3 Glue the pine strip part (2c) 10 x 20 x 30mm on to part (2d) 10 x 20 x 20mm to make up the drivers seat as shown. Glue it place 15mm from the end of the chassis.



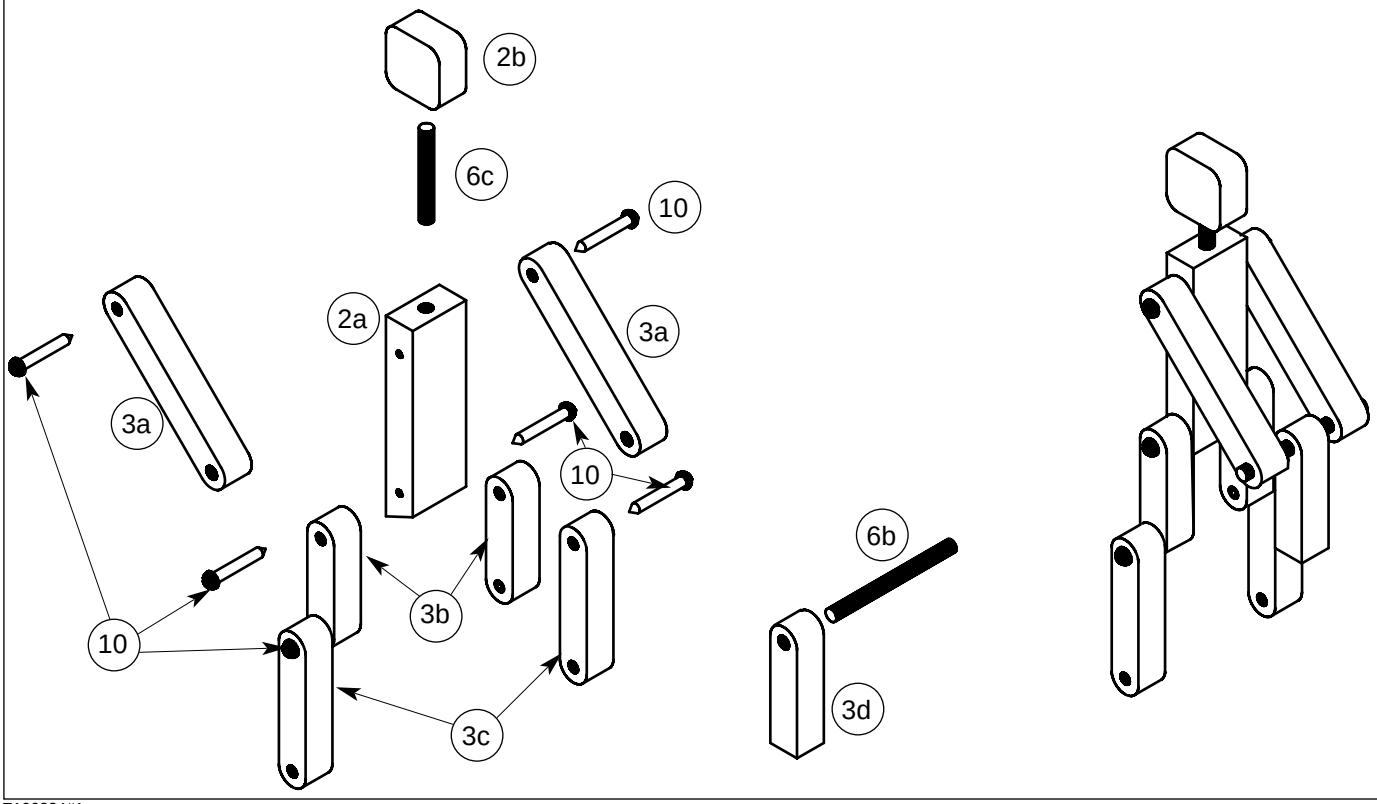
6.7 Making and assembling the figure

6.7.1 Mark out the limbs on the pine strip (3) as shown and drill the holes and saw out
Sand all the parts



6.7.2 Cut from the dowel (6) a piece (steering/6b) 25mm long and a piece 25mm (Neck/6c)

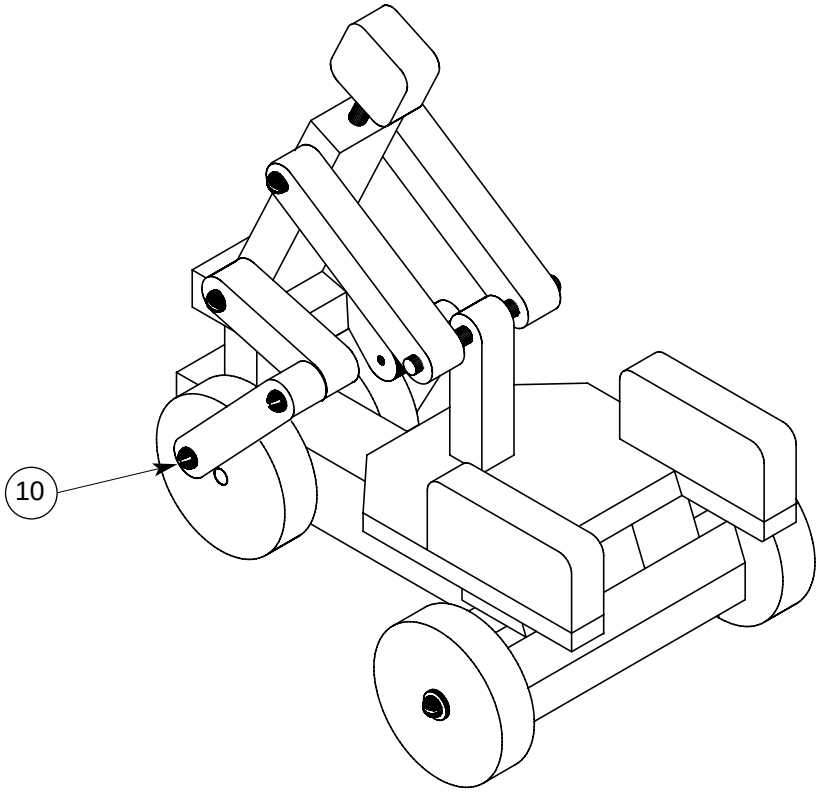
6.7.3 - Glue the neck (6c) in the body (2a)
- Glue the steering post (6b) in the holder (3d)
- Insert a screw (10) in the 3.5mm hole in the arm (3a) and screw it into the 2 mm hole in the body, leave to rotate freely. At the same time insert the steering post the 4mm hole in the arm. Centralise but do not glue!
- Add a screw (10) in the 3.5mm hole in the leg (3c) and in the thigh (3b) Screw in to the 2mm holes –leave to rotate freely
- Insert a screw (10) through the 3.5 dia hole in the thigh and fix it into the 2mm hole
- In the body so that the legs can move freely



6.8 Assembly of the rickshaw driver

6.8.1 Insert a screw (10) through the 3.5 hole in the leg (3c) . Sit the figure on the seat and tighten the screw in the 2mm hole in the wheel (8a) Arrange the screw (10) so that the leg can move freely

6.8.2 Now carefully arrange the figure so that the steering post is in the middle of the base and that the body is sloped forward in the correct position. Before gluing in position check that the figure moves freely when the rear wheels are rotated. Glue the body on the seat and the steering post in place.



6.9 End assembly and testing

6.9.1 Fix the aluminium sheet (Mobile phone holder) using the screws (7) to the rickshaw.