

SS005 Paving Brick

Brick 1.4kg
400g plastic
1000g sand

30mm thickness (usually 2" thick - 1.5 inch tiles are also common)
hex side length 110mm (180mm diameter).

Sand heated, then stirred with pellets to form slurry. Sand heated on hob over gas flame.

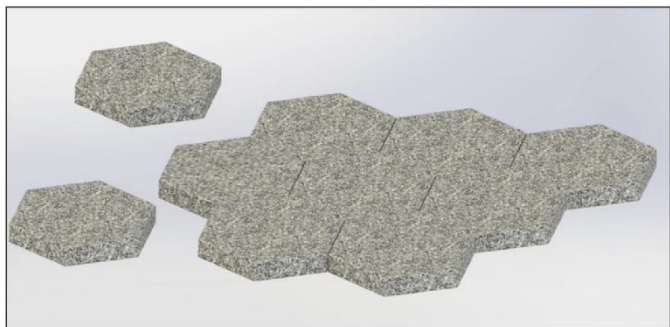
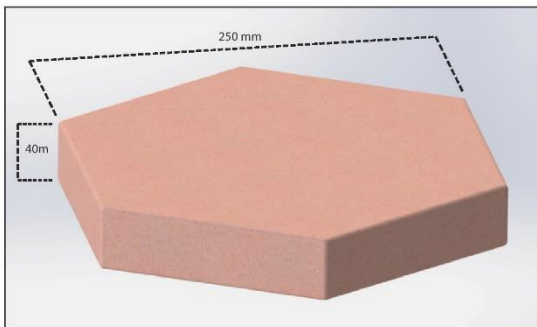
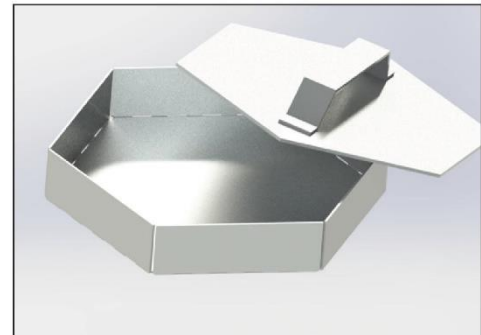
Sand: \$60 for one truck of sand (4 tonnes) - \$0.01 per kg

Plastic: \$0.20 - 0.25 per kg for sorted plastic

Cement: \$0.2 per kg for cement - 950-1000Rs per 50kg sack

Hexbrick
Tom van der Vaart
11-2017
Rotterdam

Hexbricks have an easy to mold shape.
Currently applied as paving bricks.
Aesthetic design features could be integrated in the lid.
Bricks lay loose and might shift position

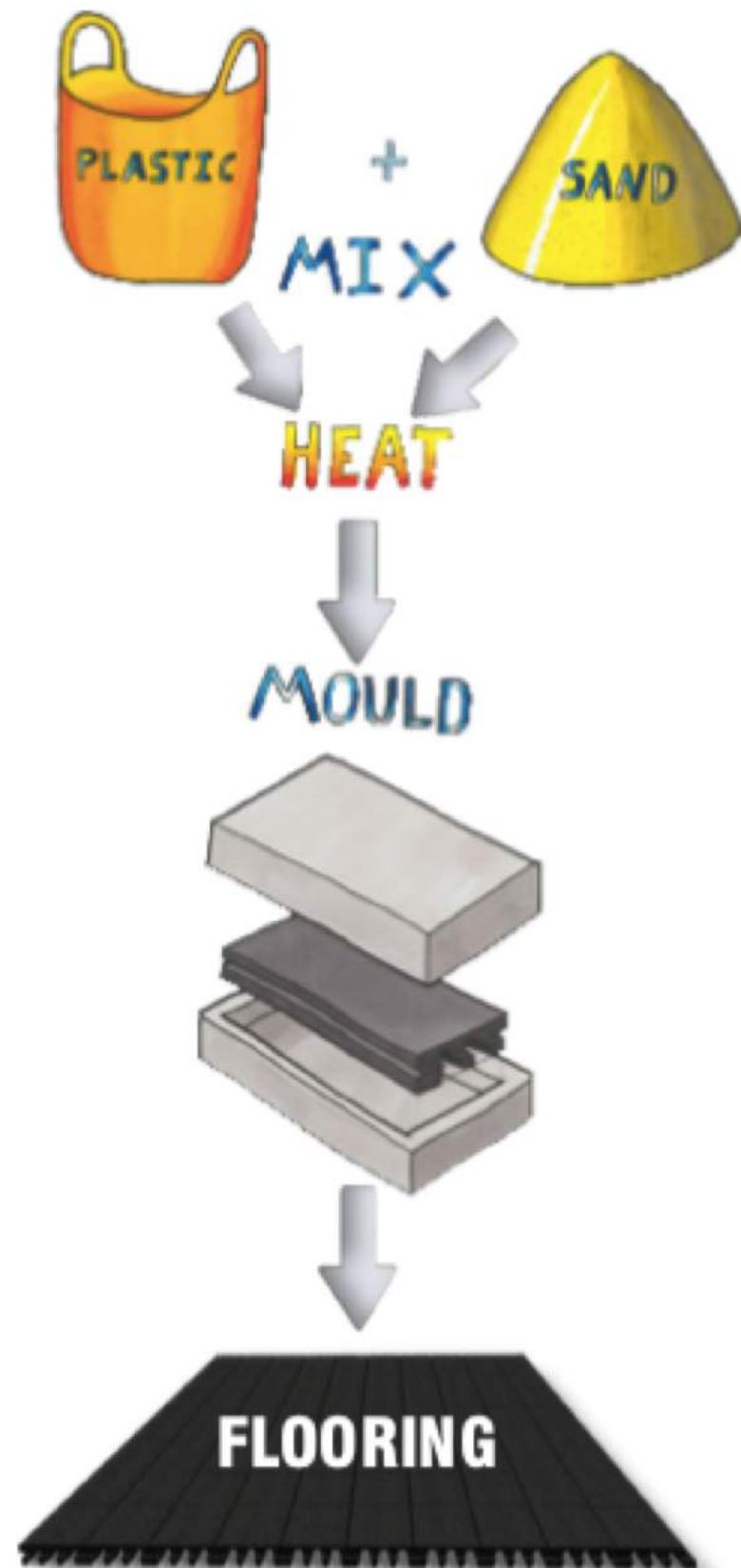


ontwerp jezelf

industrieel product ontwerpen

Amini plastiki





Bill of Materials

Machine Cost	cost per item	qty	cost	Notes
3mm steel (KSH per mm^2)	7000	94500	223	Qty in mm2
black pip 2.5" , 6m	2700	0.15	68	qty in m
black pipe 3", 6m	3800	2	1,267	qty in m
angle lines 3/4 x 3/4 x3mm	650	1.5	163	length used for chimney handles
oil drum	1400	1	1,400	sold in kilifi - buy a round one
galvanized plate 16G (1.5 mm)	5600	872480	1,643	
silver hinges 4" pair	180	2	360	In pairs
rebar	0	1	0	
wooden handle	0	2	0	free wood
labour (fundhi per day)	1000	3	3,000	2 people x 1.5 days
Buckets	0	2	0	One for measuring sand, one for water butt
Sacks	0	1	0	For measuring plastic by weight
Mould Tool	45	1	45	Use sheet metal (galv)
		Total (KSH)	8,167	
		Total (USD)	82	
		Total (GBP)	63	

Making the furnace

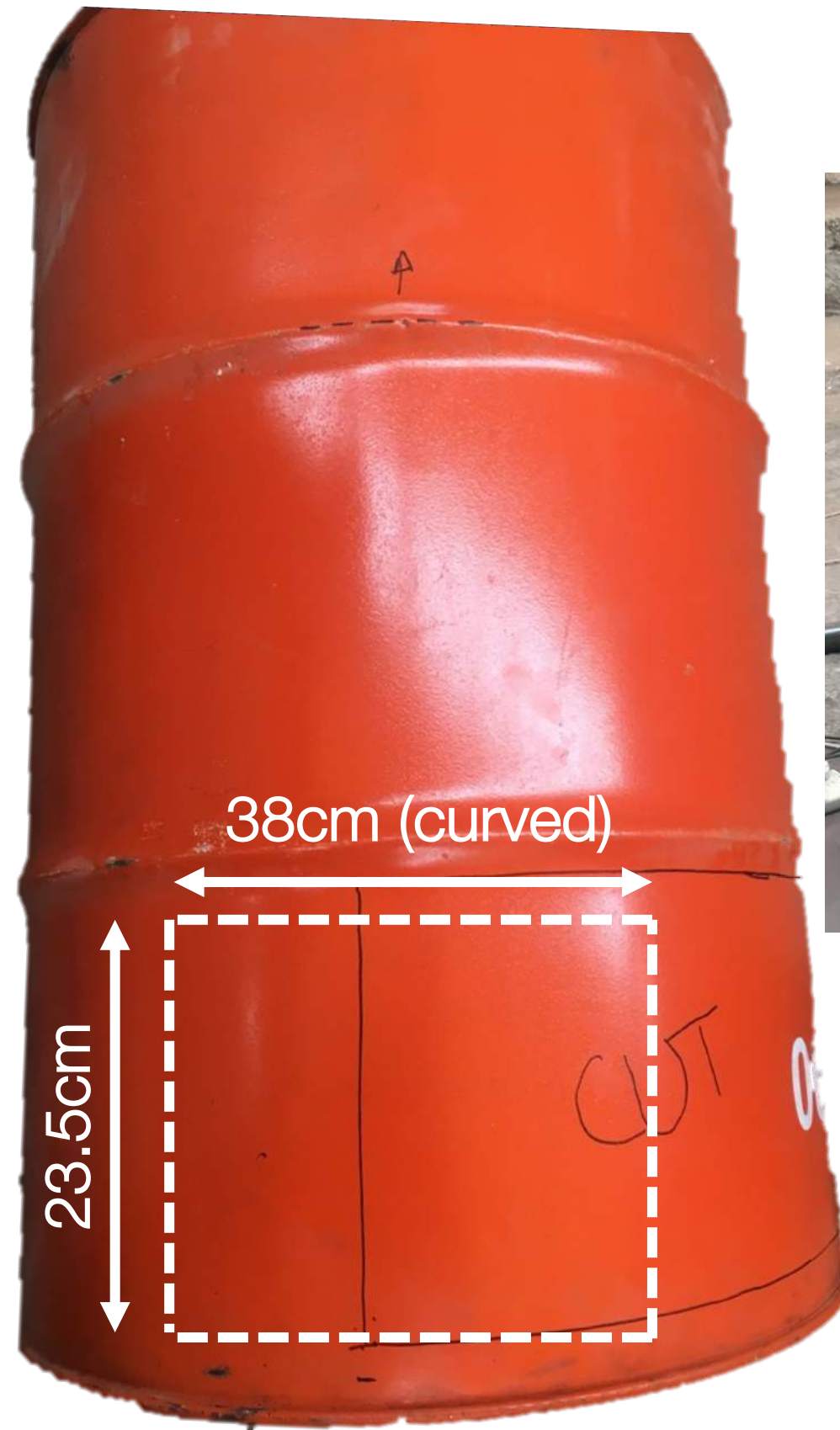
Cutting the oil drum (part 1)

Cut the oil drum
along the dotted line
(separating the top
1/3)



Cutting the oil drum (part 2)

Cut a door out of
the oil drum
(dimensions shown)



Cutting the oil drum (part 3)

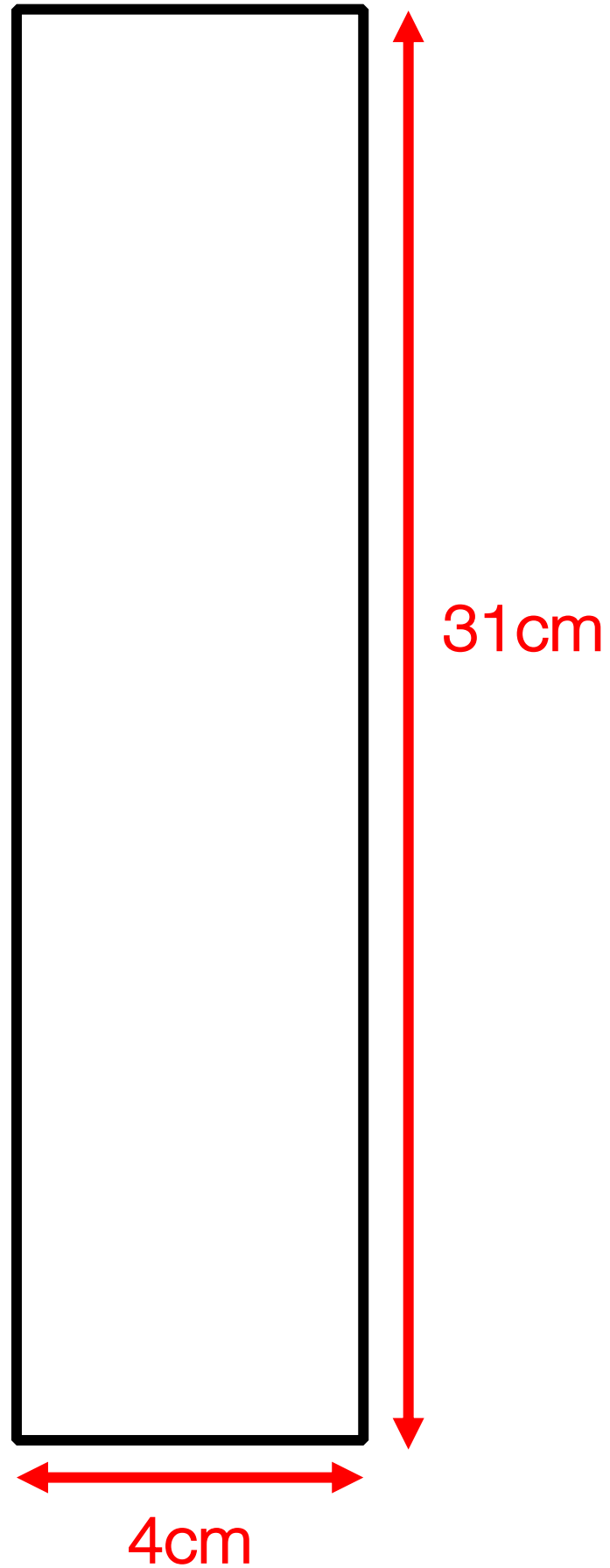
Cut slits into the
bottom part of the
oil drum



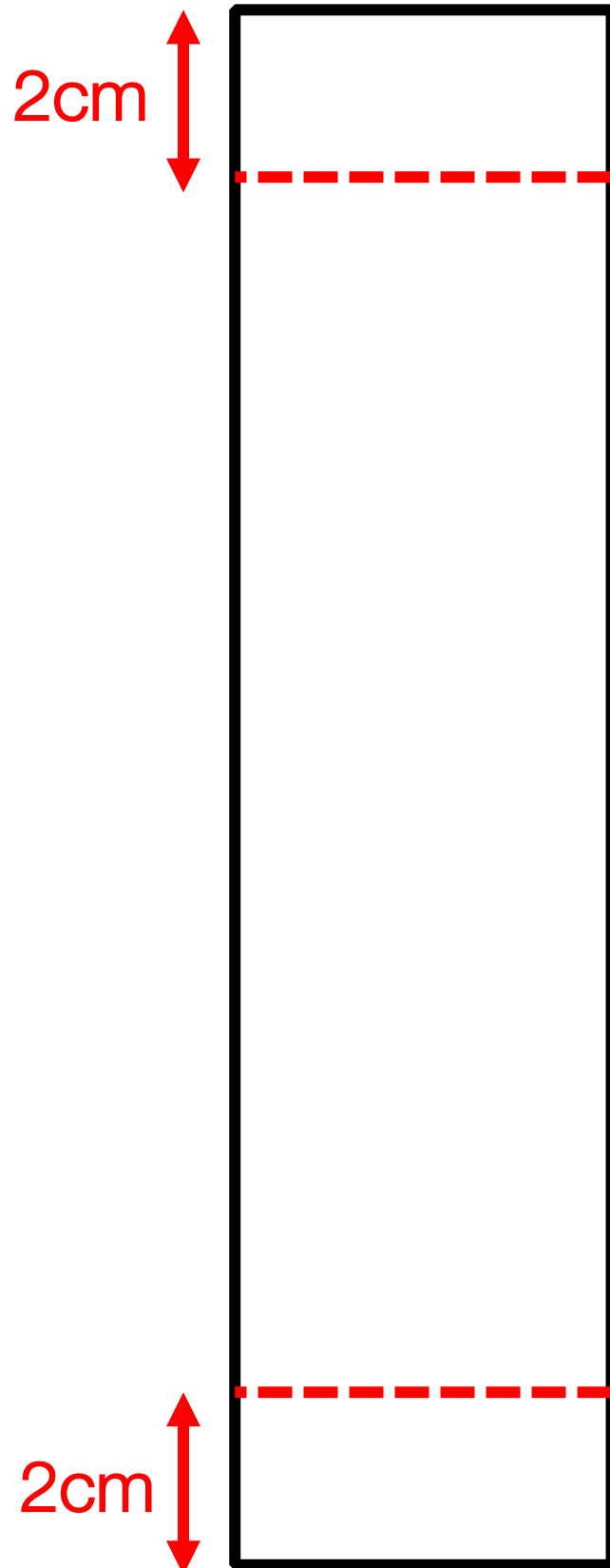
* The slits allow oxygen to enter the bottom
of the furnace to create a better fire

Making the door handle (part 1)

Cut out a piece of
3mm thick
iron/steel

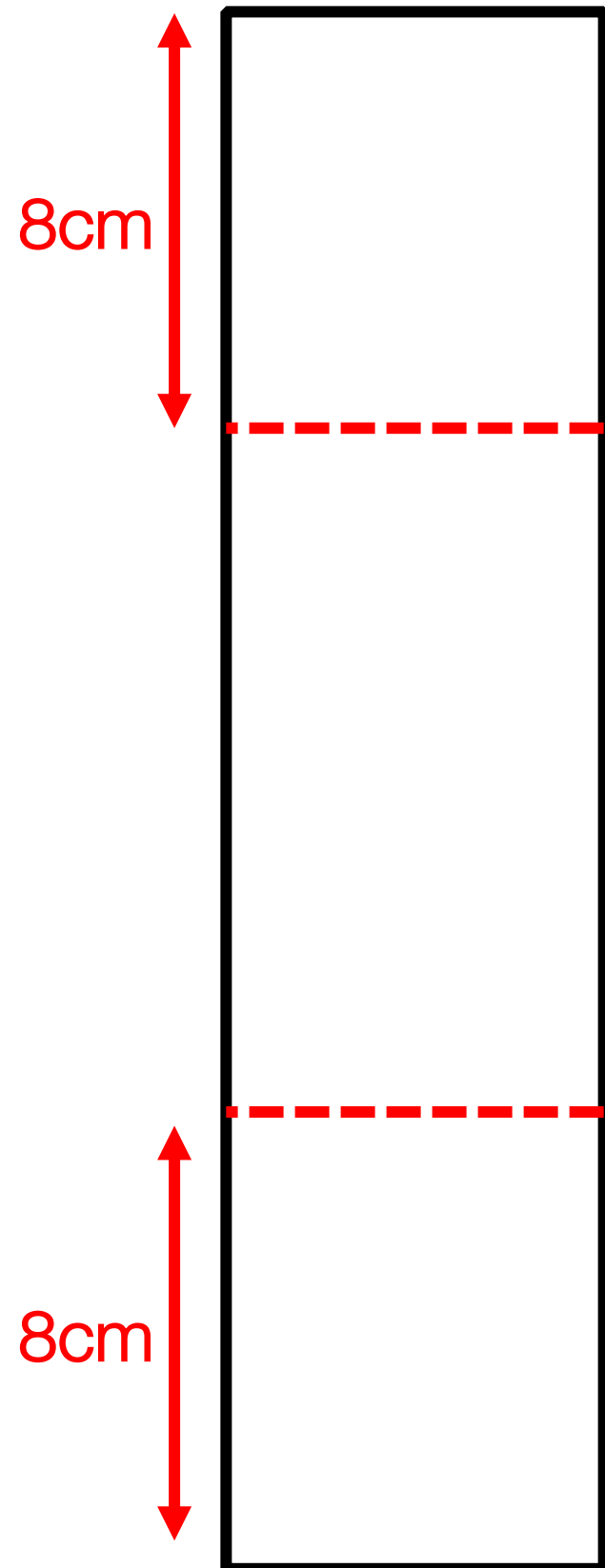


Making the door handle (part 2)



Lightly score but
don't cut these lines
using an angle
grinder

Making the door handle (part 3)



1. Turn over the metal piece

2. Lightly score but don't cut these lines using an angle grinder

Making the door handle (part 4)

Bend the sheet metal where the lines are scored to 90 degrees (as shown in photo)



Completing the door (part 1)

Weld the handle
onto the right side of
the door



Completing the door (part 2)

Weld a 4" hinge
onto the outside of
the door and oil
drum



The bottom part of the furnace complete!



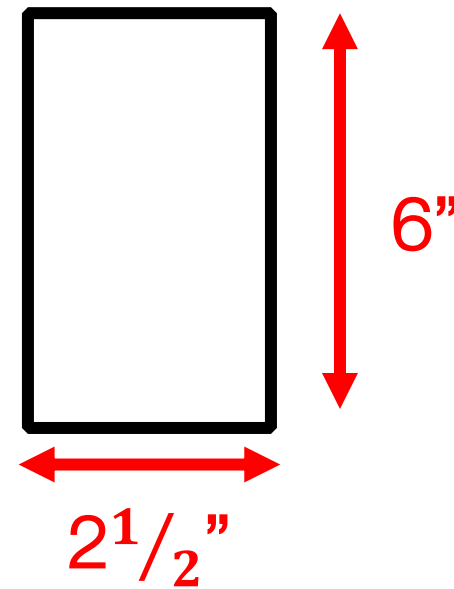
Making the top of the furnace (part 1)

Drill a hole of
diameter 1" in the
middle of the top of
the oil drum



Making the top of the furnace (part 2)

1. Cut off 6" of a 2 $\frac{1}{2}$ " diameter steel pipe



2. Weld the pipe to the centre of the oil drum (ONLY WELD ON THE INSIDE OF THE PIPE!)

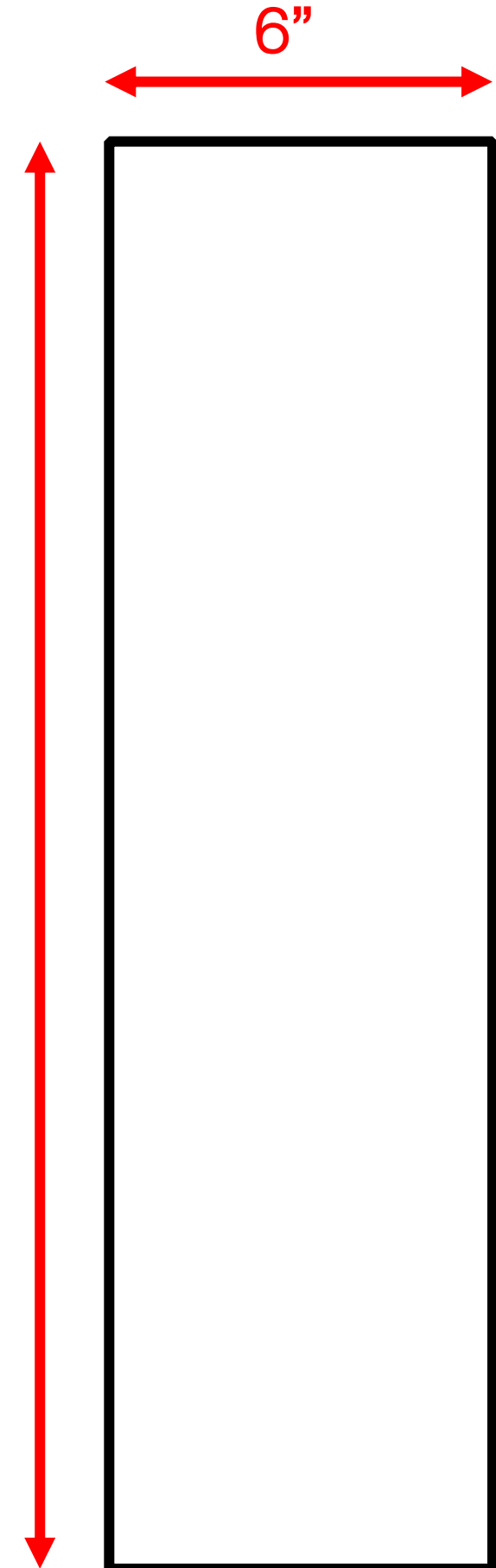


Making the top of the furnace (part 3)

1. Measure the diameter of the oil drum (~58cm)

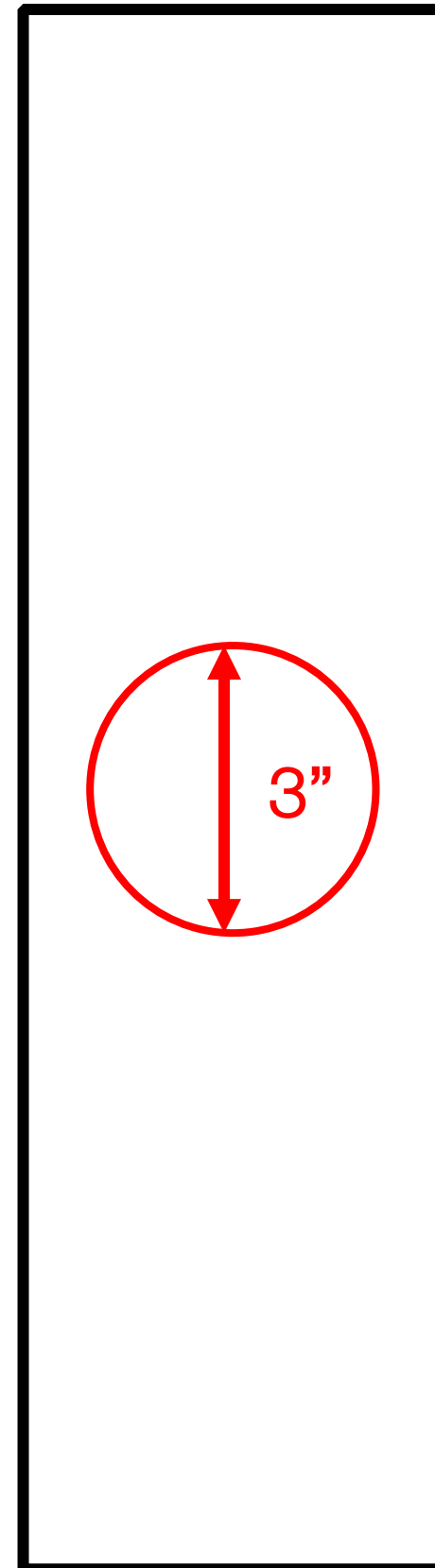
2. Cut out a sheet of 3mm thick iron/steel with dimensions shown

Diameter of
oil drum + 2"



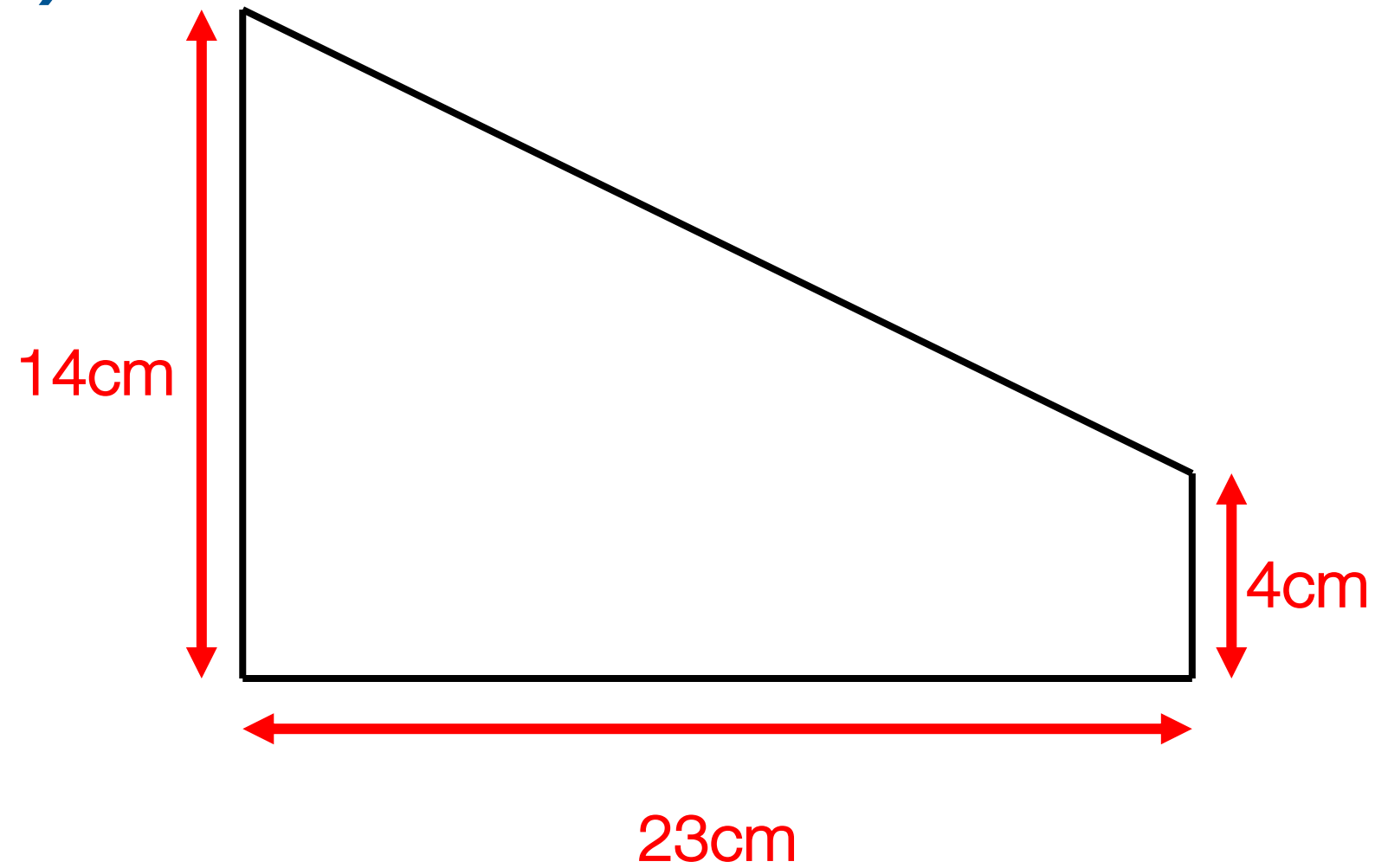
Making the top of the furnace (part 4)

Cut out a 3" diameter hole in the
centre of the steel piece
(*if a 3" drill bit is not available,
the hole can be cut using a
welding rod)

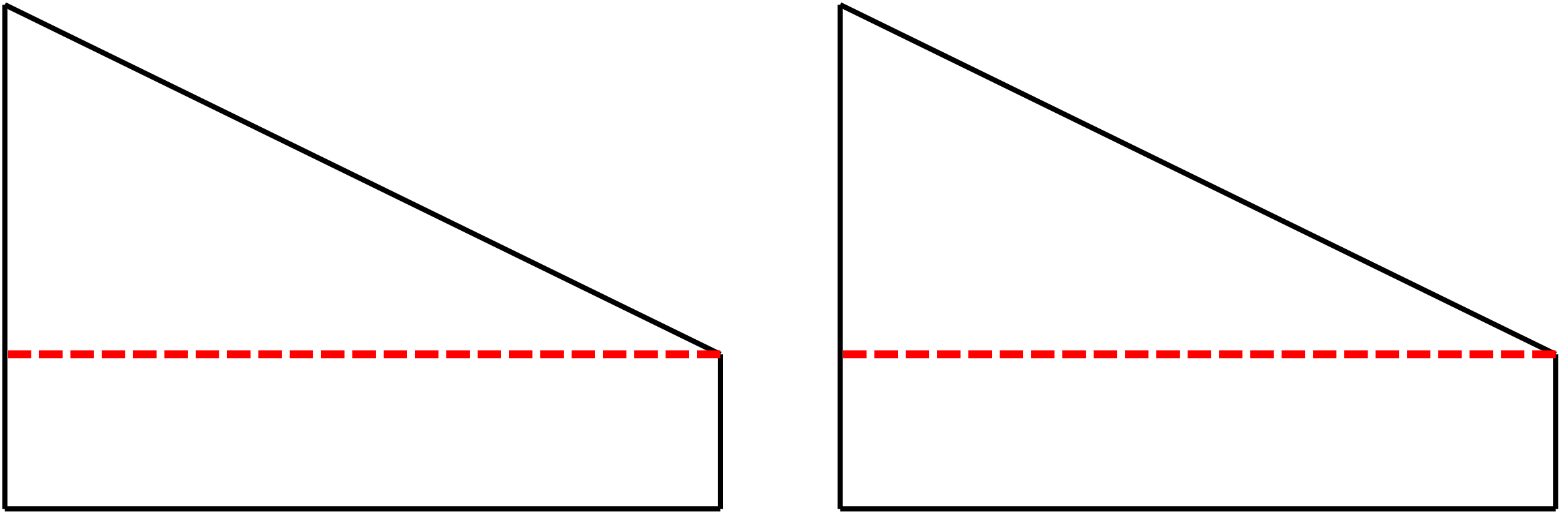


Making the blades (part 1)

Cut out 2 blades from a 3mm thick iron/steel sheet (dimensions shown)



Making the blades (part 2)



Lightly score but don't cut a line on the same
side of each blade using an angle grinder

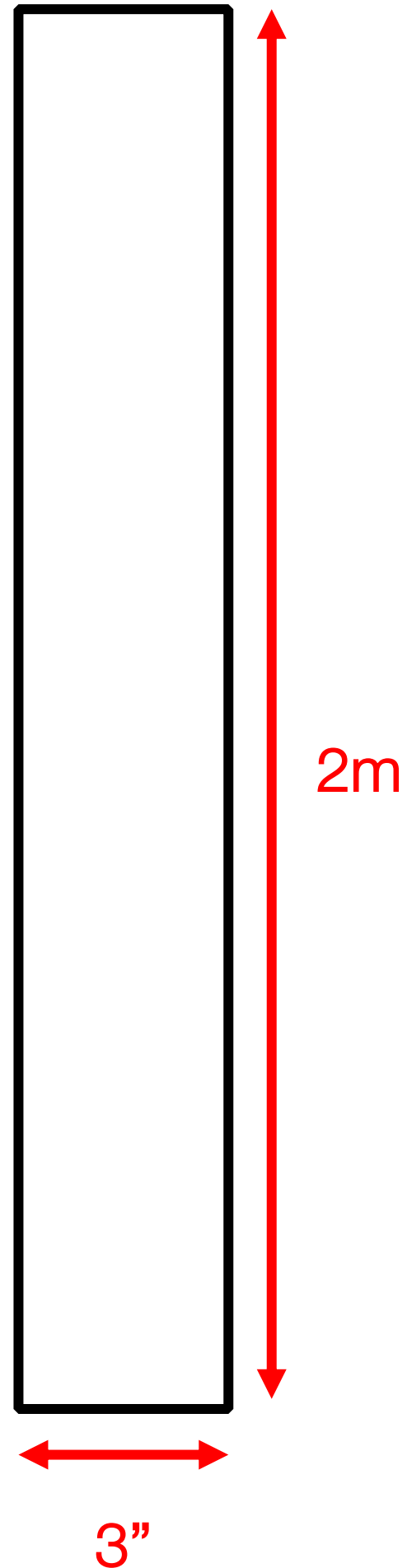
Making the blades (part 3)

Slightly bend the blades
(by around 10 degrees)



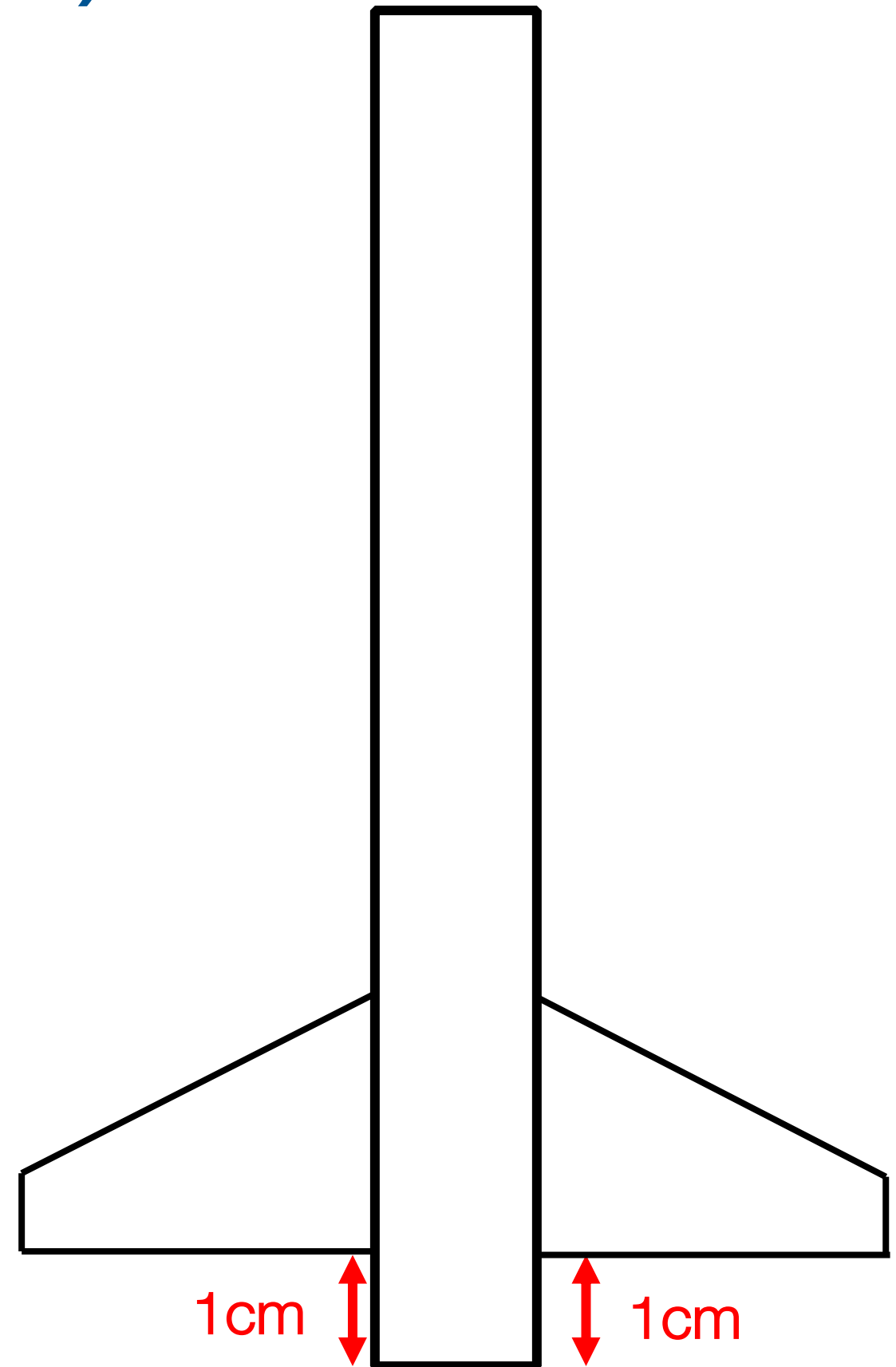
Making the chimney/mixer (part 1)

Cut off 2m of a 3"
diameter steel pipe



Making the chimney/mixer (part 2)

Weld both blades onto
the bottom of the 3" pipe
(leaving a 1cm gap
between the bottom of
the blade and the bottom
of the pipe)

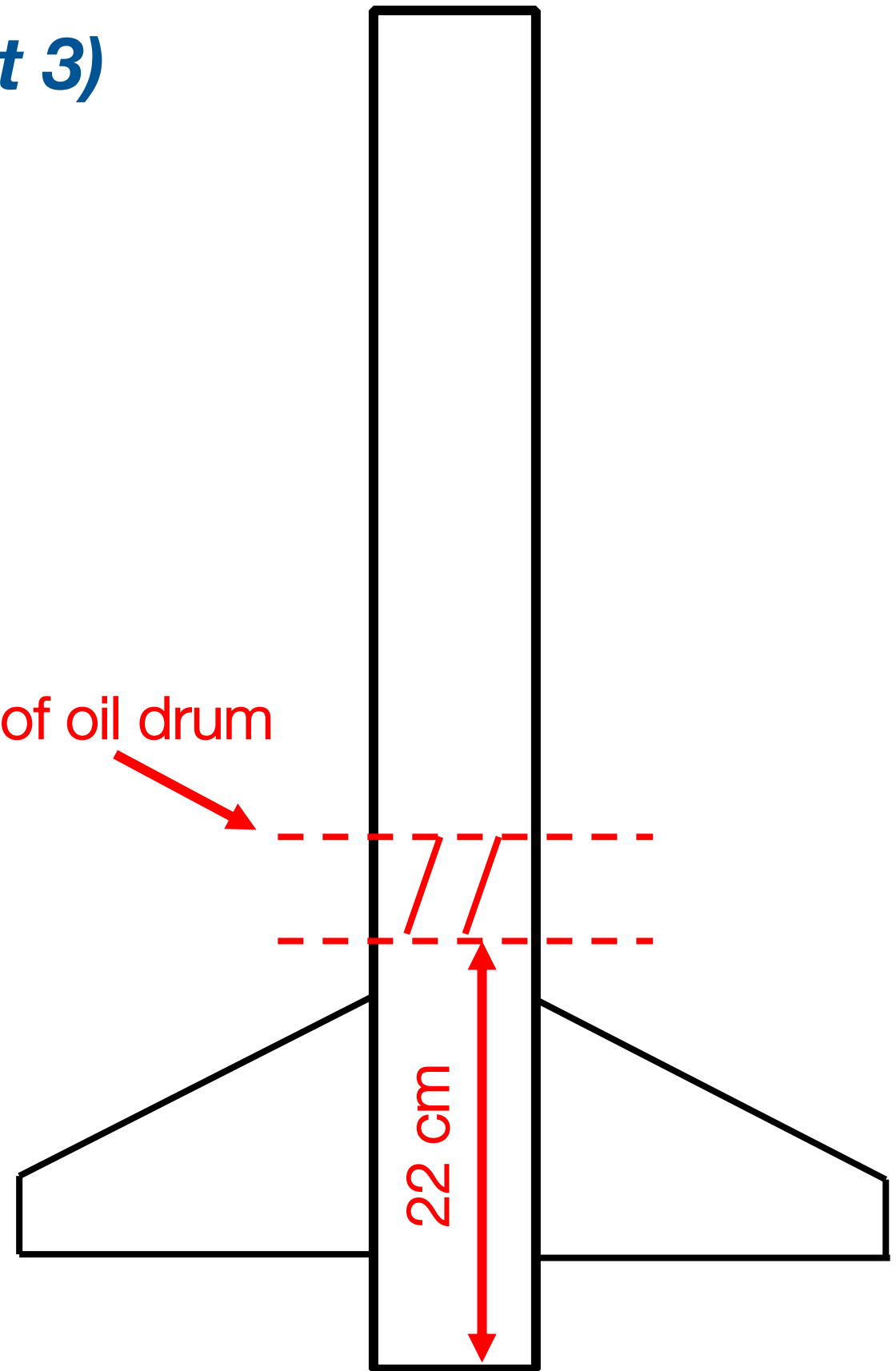


Making the chimney/mixer (part 3)

Cut diagonal slits all around the 3" pipe between the heights labelled by the dotted line



Top of oil drum

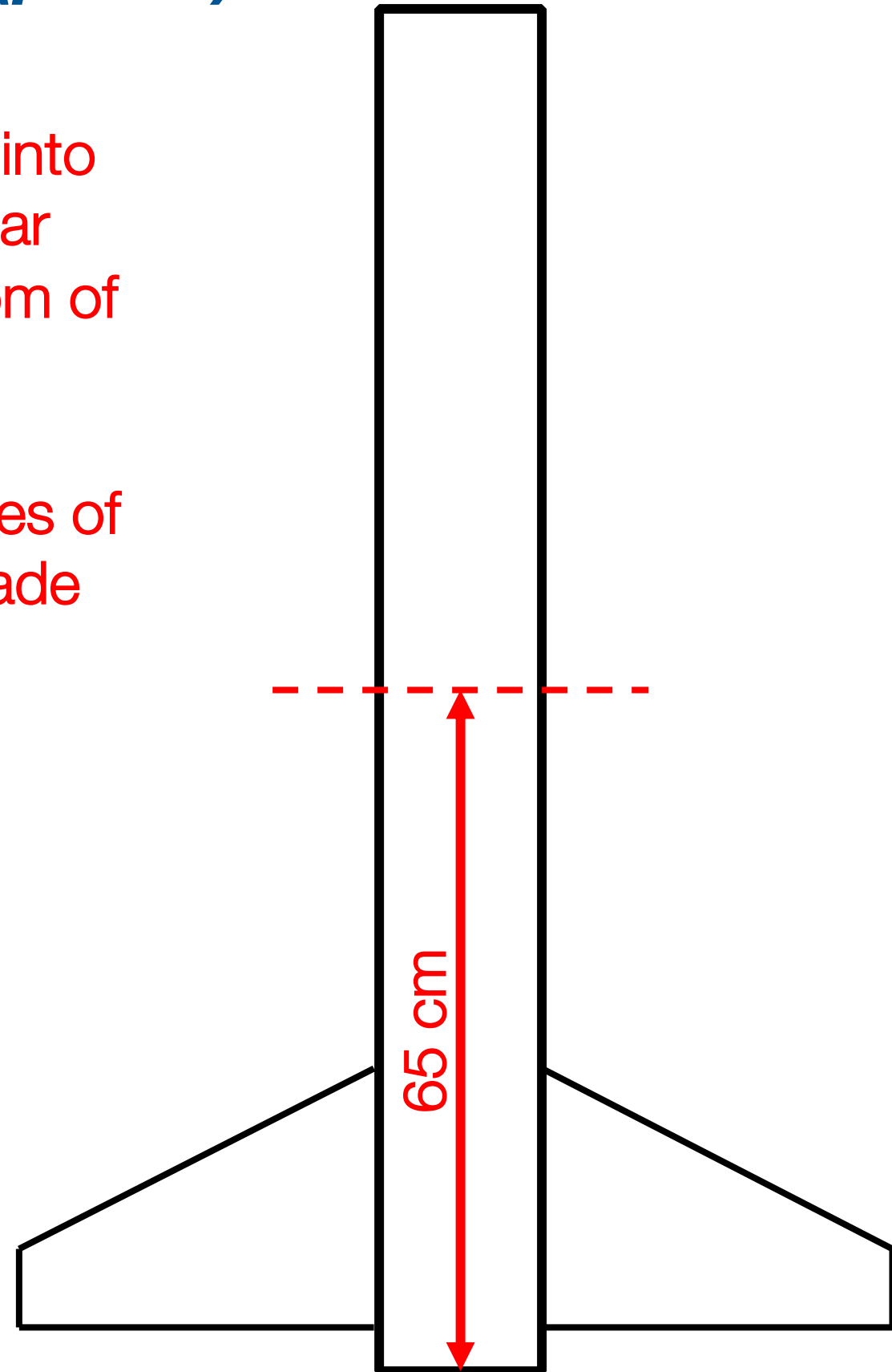
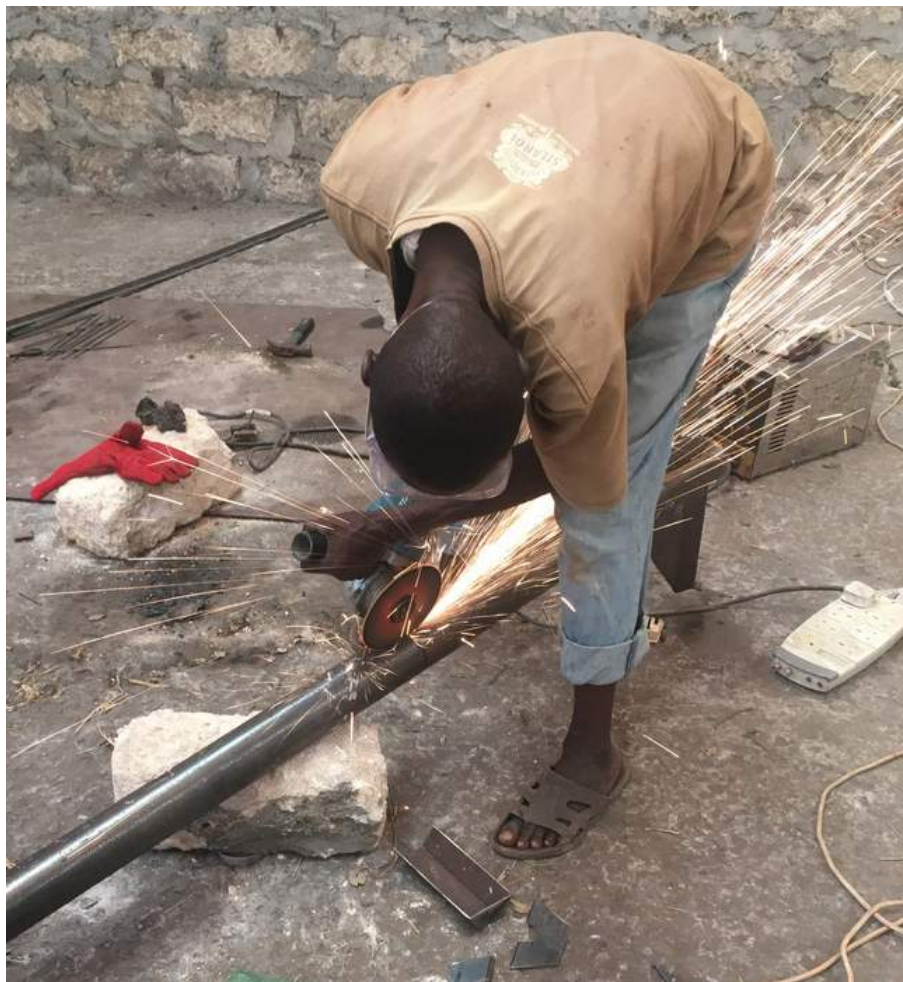


* The slits will allow the fumes from the plastic to go out through the chimney

Making the chimney/mixer (part 3)

Use an angle grinder to cut 2 holes into the 3" pipe (that can fit an angle bar through it) – 65cm up from the bottom of the pipe

The holes should be on opposite sides of the 3" pipe, and inline with each blade



Making the chimney/mixer (part 4)

Push the top of the 3"
pipe through the hole in
this piece of cut metal



Making the chimney/mixer (part 5)

Weld this piece of metal to
the sides of the oil drum



Making the chimney/mixer (part 6)

Bend a metal rod around
the outside of the 3" pipe
and weld to the flat
surface



* The rod will ensure the chimney stands upright

Making the chimney/mixer (part 7)

Cut two 0.75m pieces
out of a steel angle



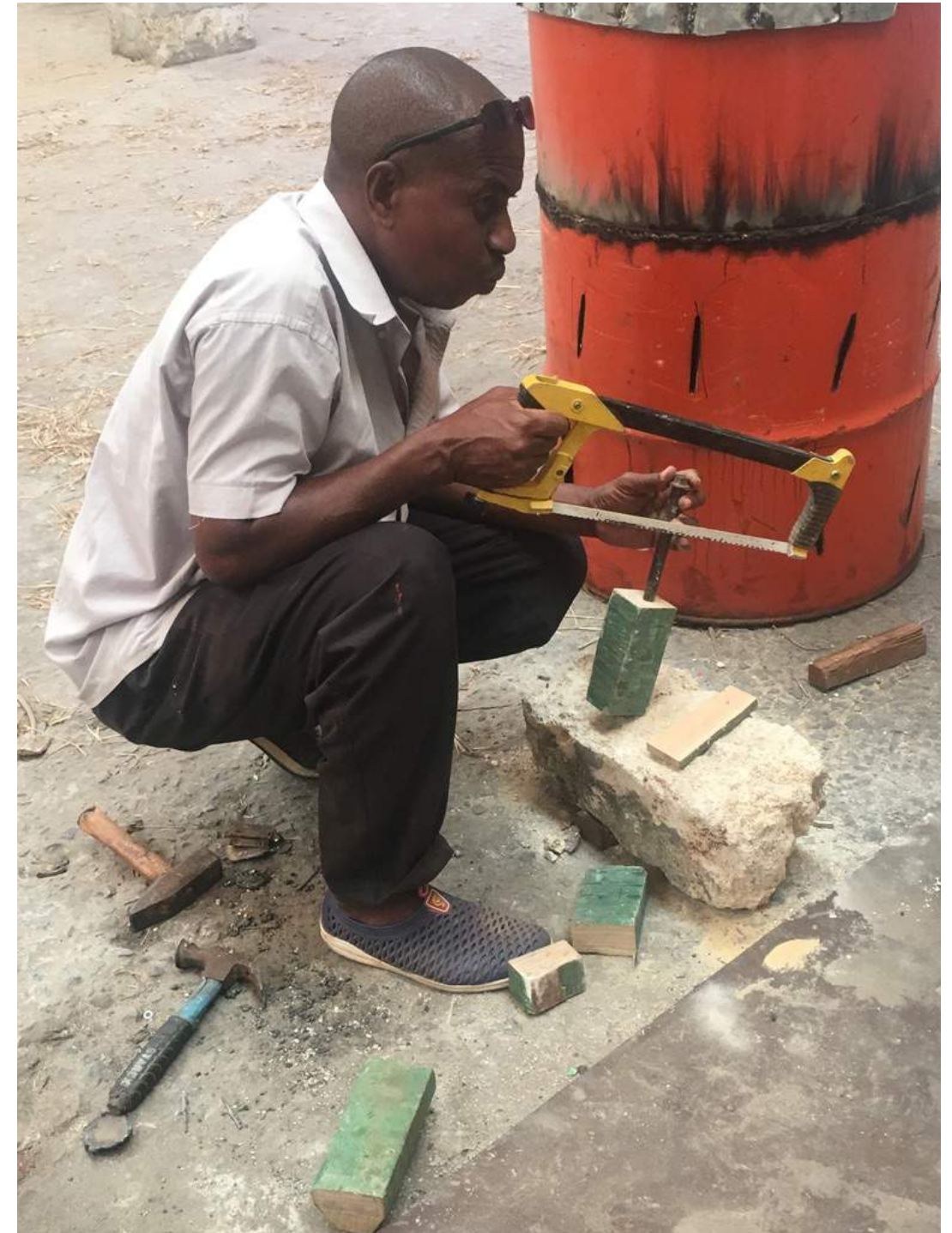
Making the chimney/mixer (part 8)

Put the two steel angles through the holes made in the 3" pipe and weld



Making the chimney/mixer (part 9)

1. Make a hole in a block of wood (with a slightly smaller diameter than a metal rod) and then force the metal rod into the hole
2. Cut the block of wood so it has rounded sides which are comfortable to hold



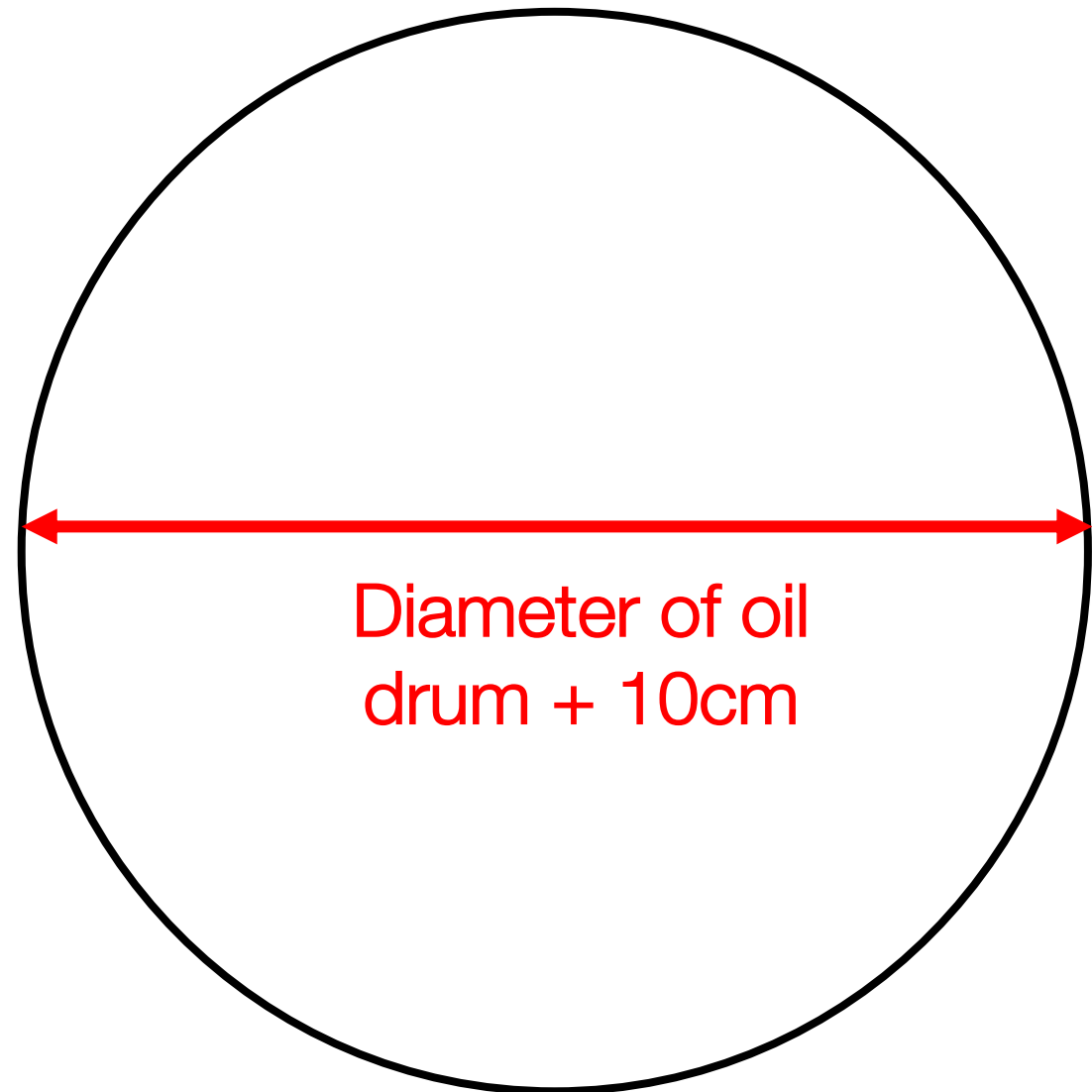
Making the chimney/mixer (part 10)

Weld one block of wood to
each angle



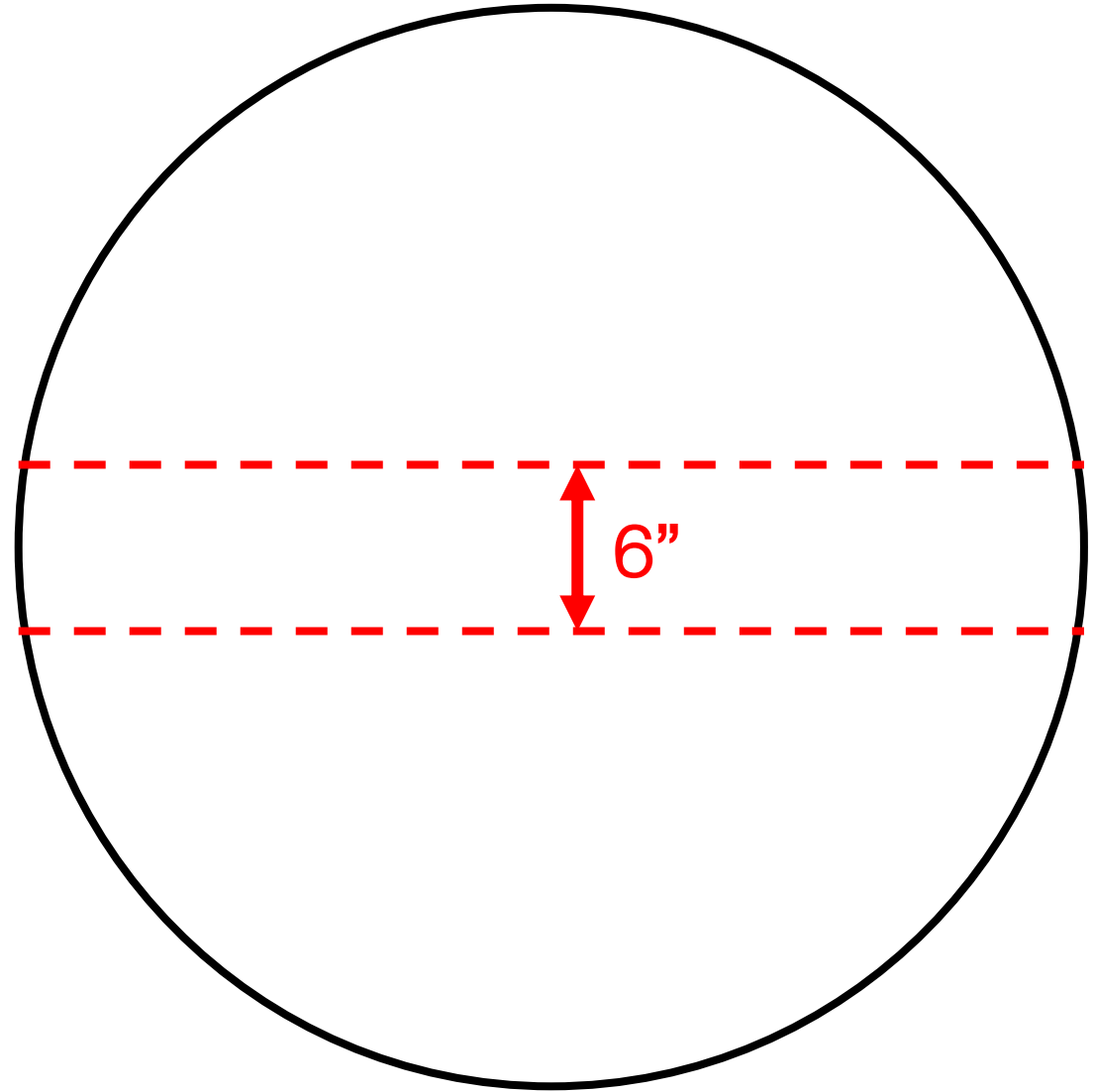
Making the lid (part 1)

Draw a circle on a steel
sheet with dimensions
shown



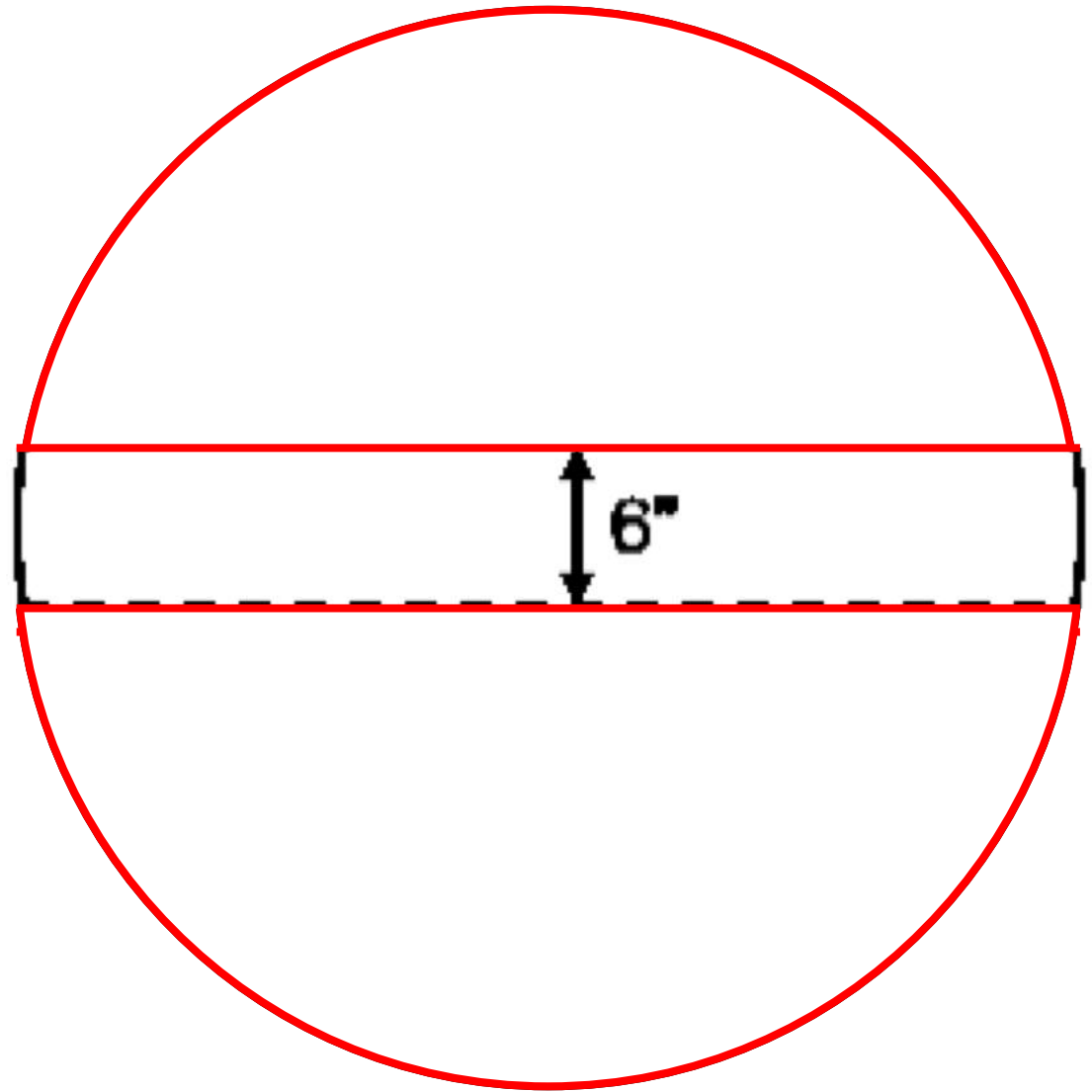
Making the lid (part 1)

Draw two lines in the
centre of the circle 6" apart



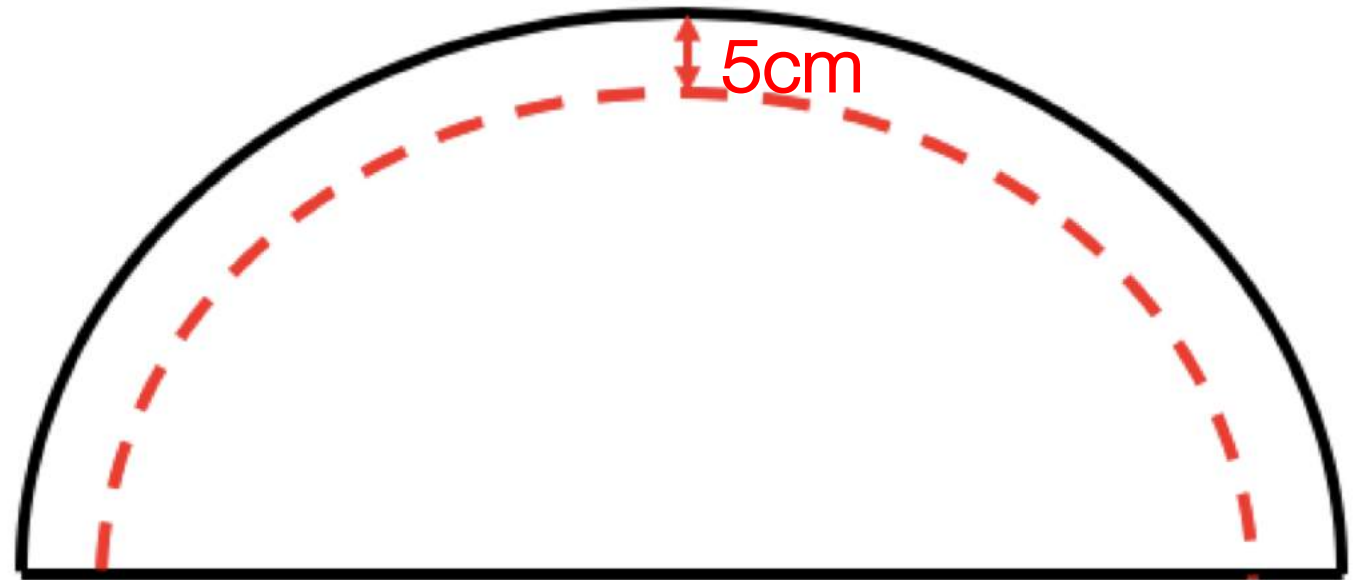
Making the lid (part 1)

Cut along the red lines



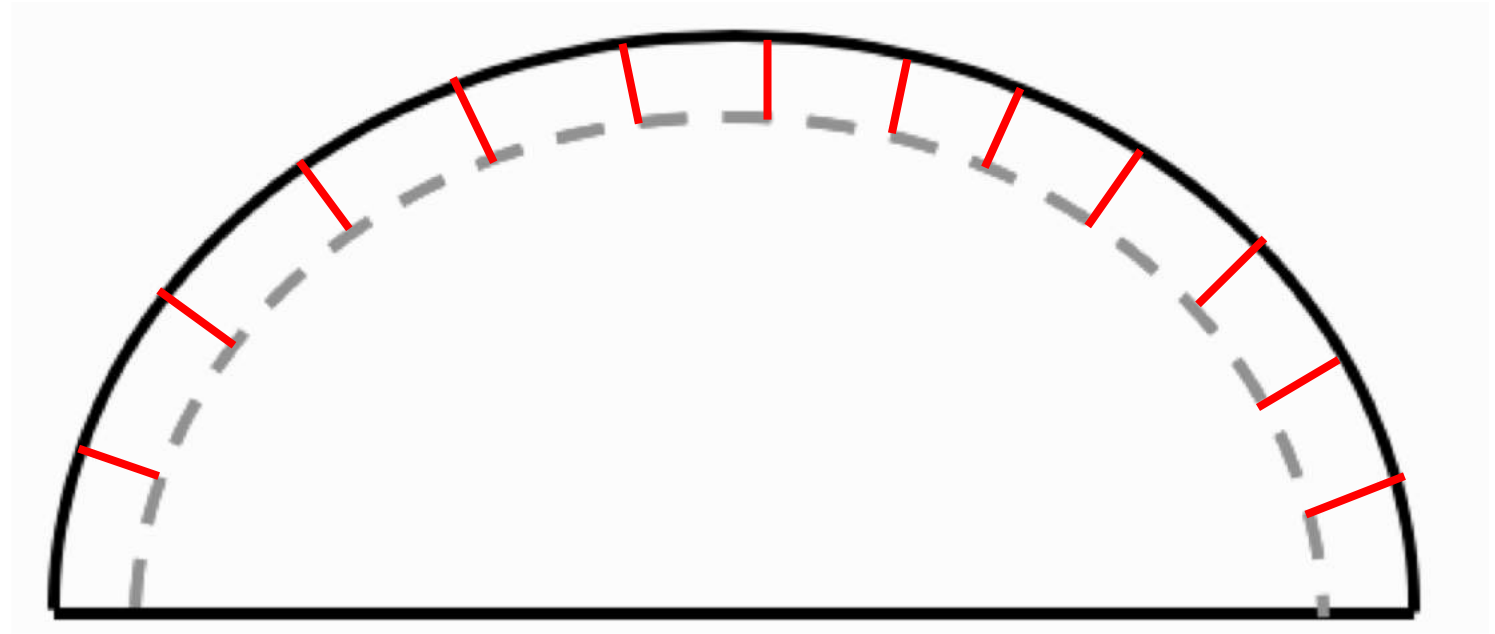
Making the lid (part 2)

Lightly score but don't cut along the dotted lines (5cm from the edge of the cut semi-circles) using an angle grinder



Making the lid (part 3)

Cut along the red lines
(from the edge of the
semi-circle to the lightly
scored line)



Making the lid (part 4)

Bend over the edges of
the semi-circles by hitting
them with a hammer



Making the lid (part 4)*

If the semi-circles do not fit perfectly, strips of metal can be welded on



Making the lid (part 5)

Weld on 4" hinges to join
the semi-circles to the
central metal strip



Completing the machine

Weld the top part of the oil drum to the bottom part



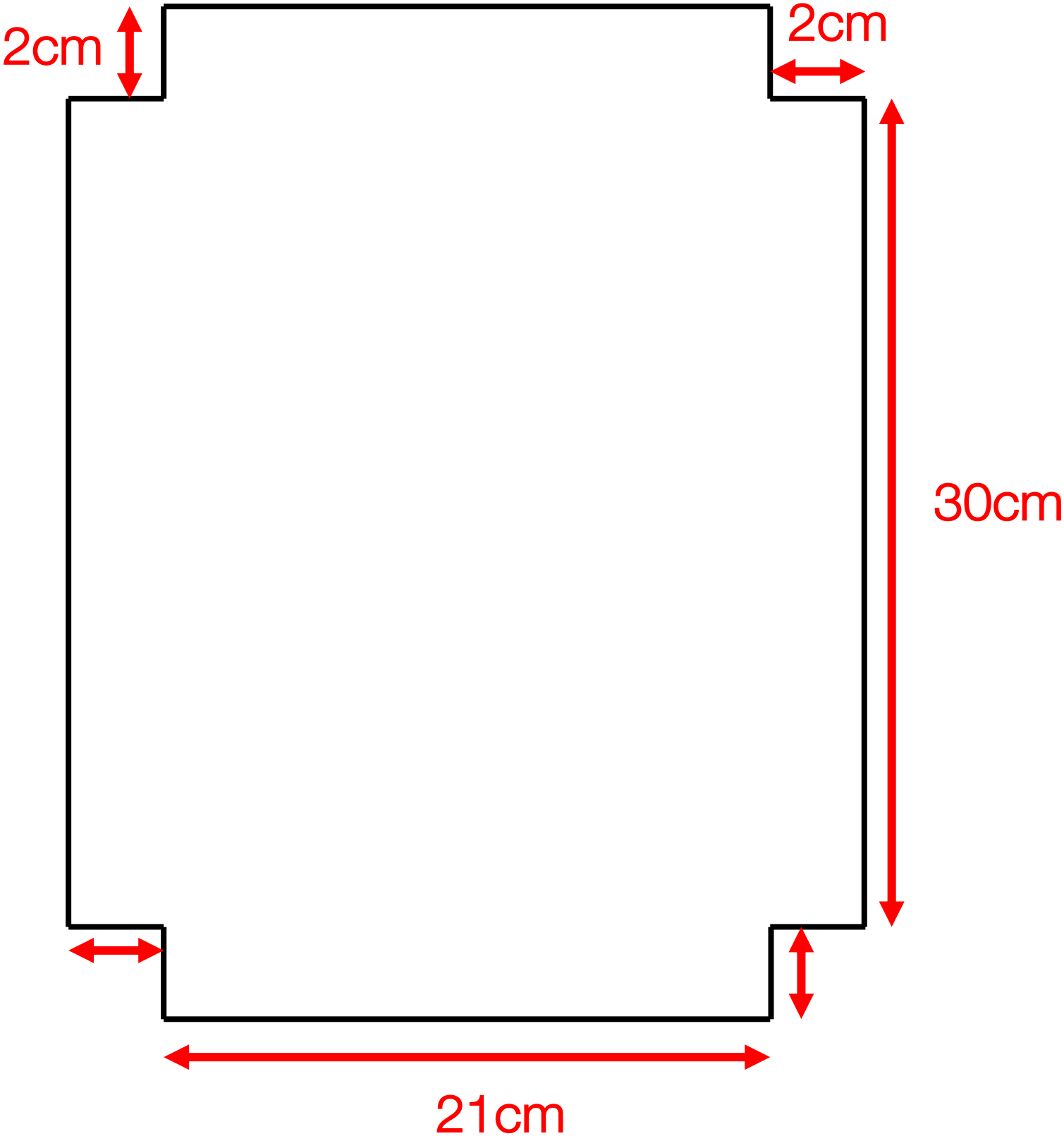
The machine is complete!



Making the Moulds

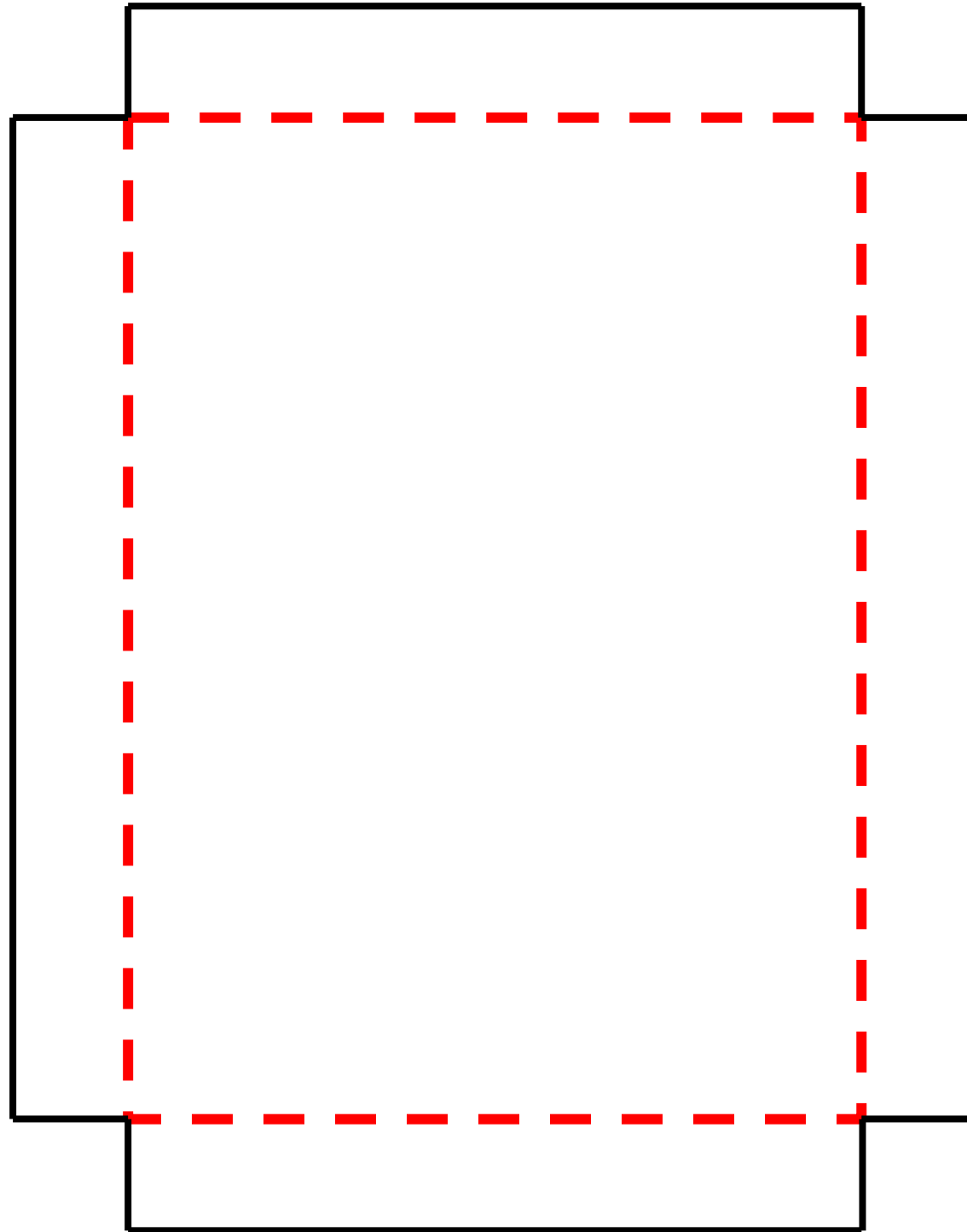
Making the moulds (part 1)

Cut a GALVANIZED
steel sheet with
dimensions shown



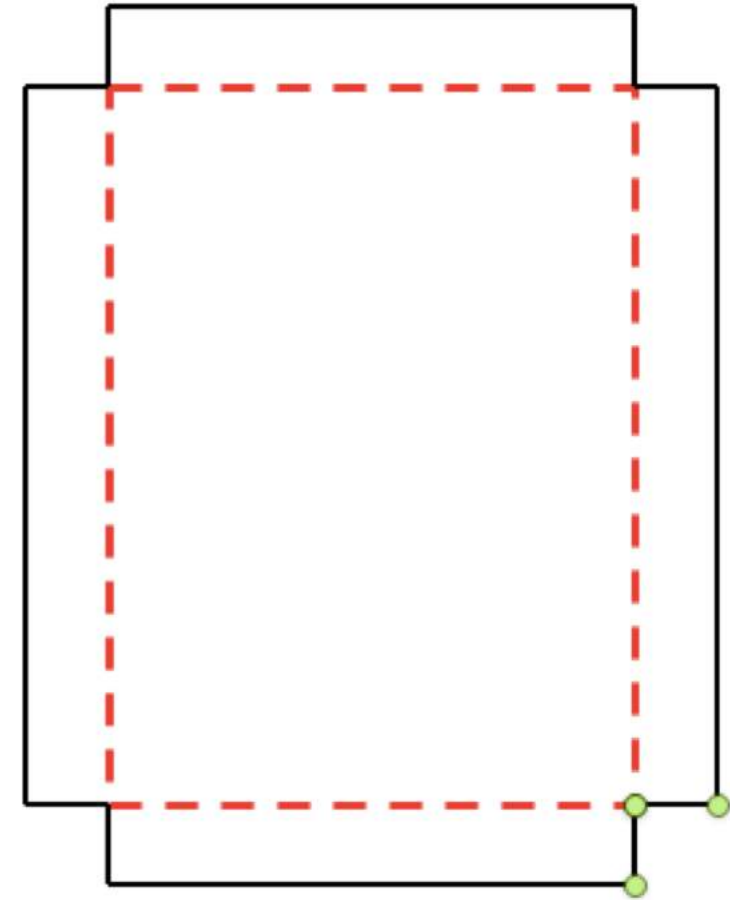
Making the moulds (part 2)

Lightly score but don't
cut along the dotted lines
using an angle grinder



Making the moulds (part 3)

1. Bend the flaps upright
2. Weld the 4 edges together



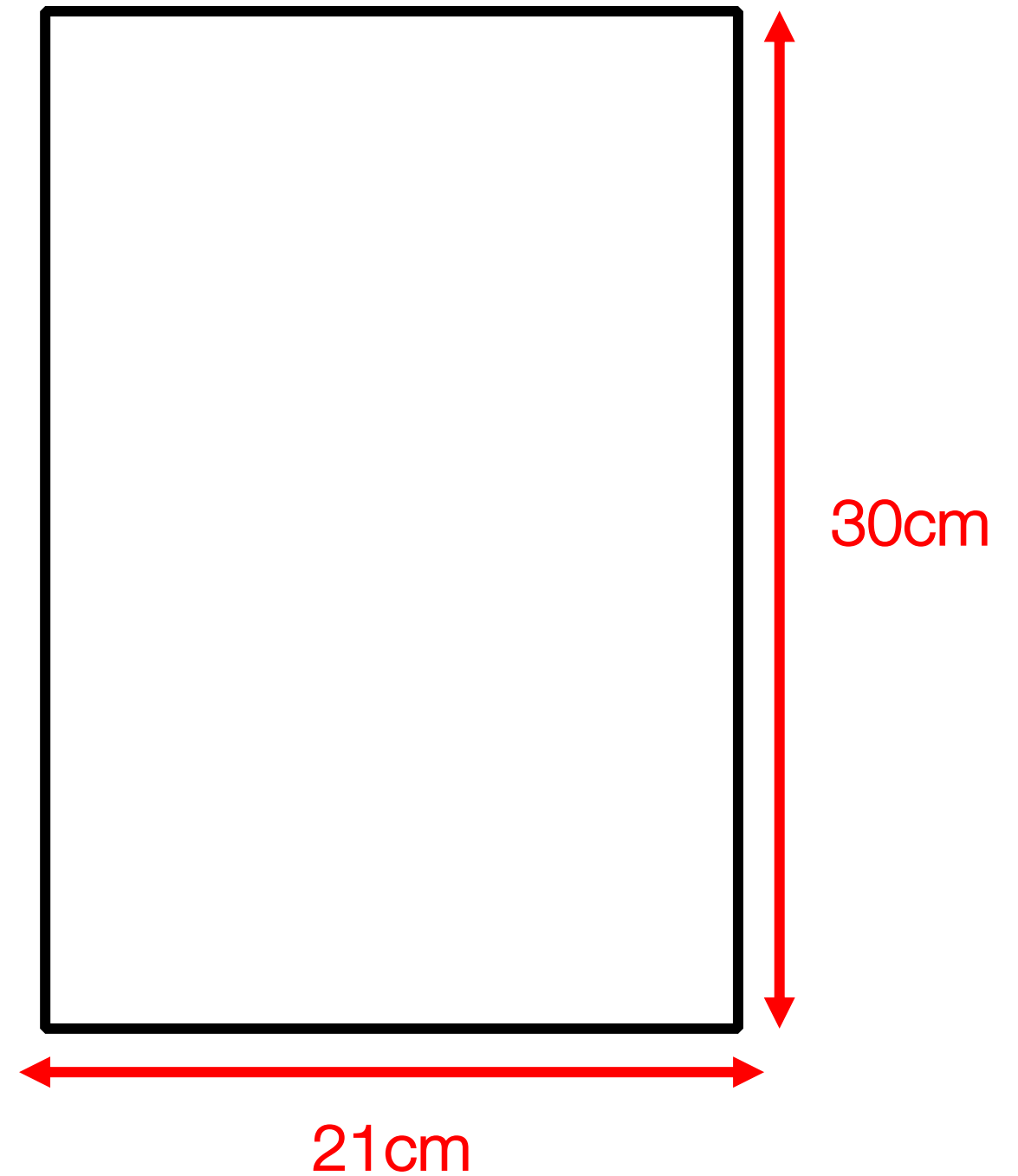
Making the moulds (part 4)

1. Bend two metal rod to form two handles
2. Weld both handles to the sides of the mould



Making the mould tools (part 1)

Cut GALVANIZED steel
sheet to dimensions shown



Making the mould tools (part 2)

Make two handles with the same dimensions as the oil drum door handle



Making the mould tools (part 3)

Weld both handles onto
the steel sheet



Making the mould tools (part 4)

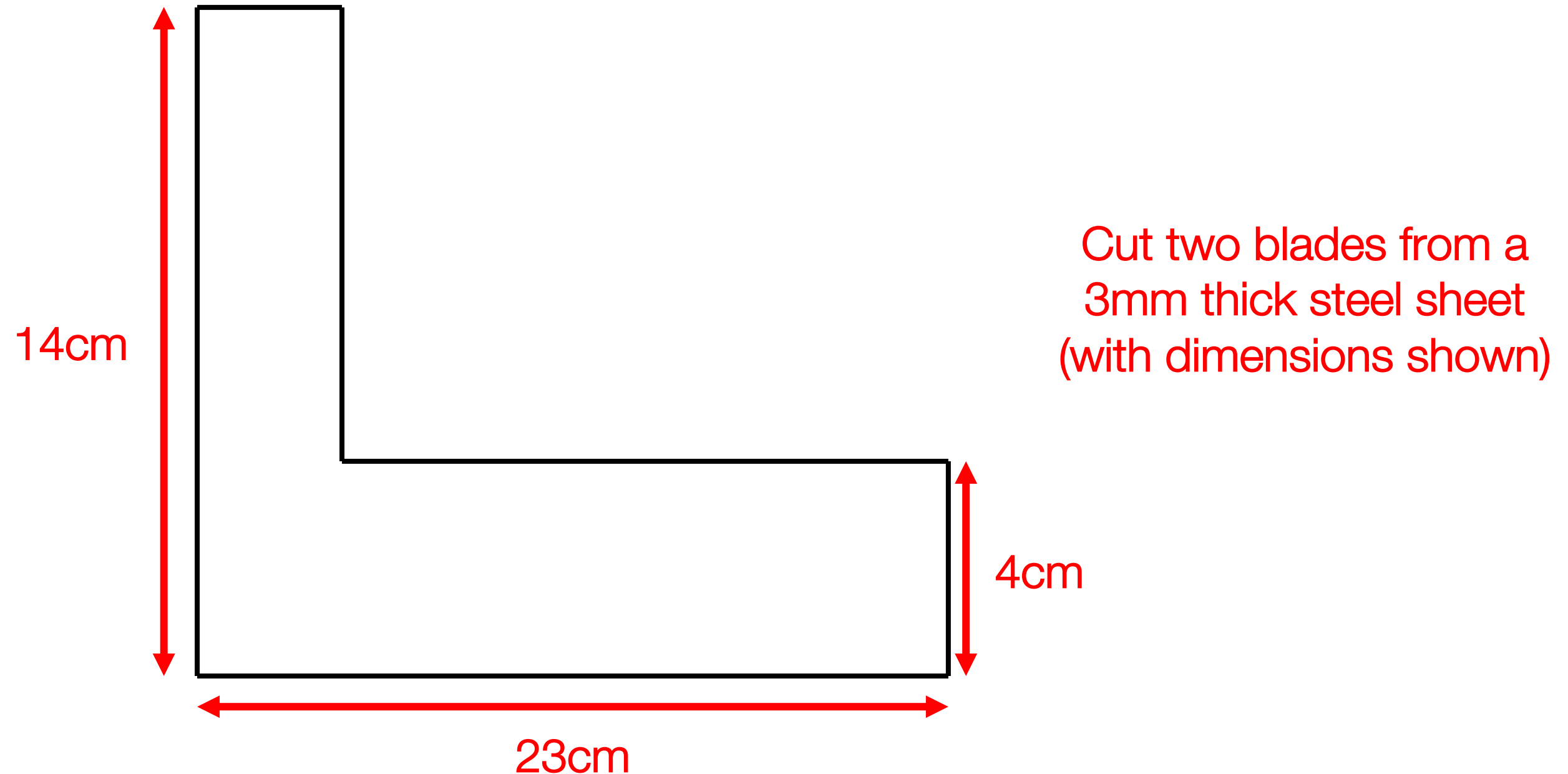
1. Cut a piece of galvanized steel sheet with dimensions 17cm x 13cm
2. Bend a metal rod and weld to the steel sheet



***Design
Improvements
& Suggestions***

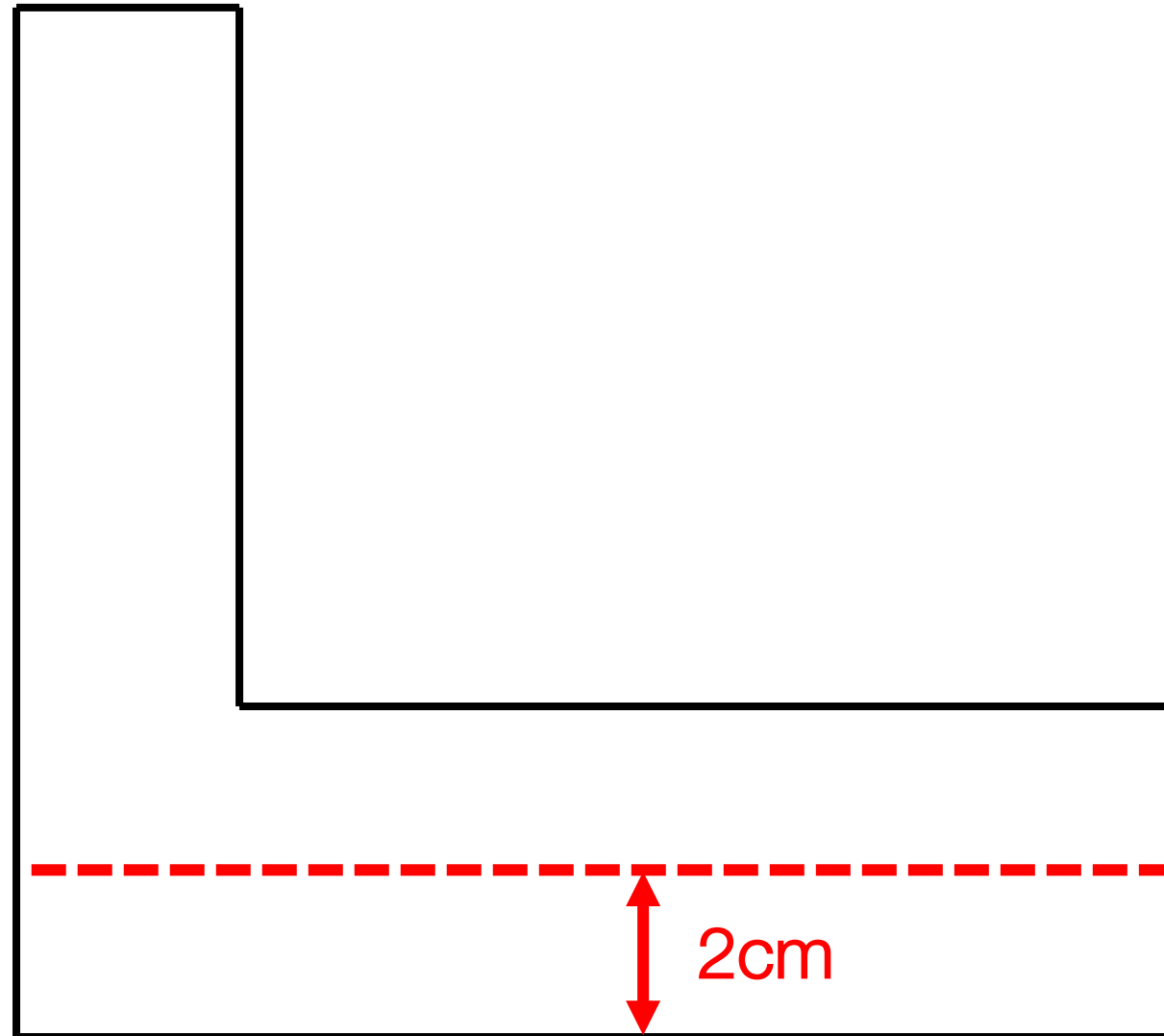
Potential Design Improvements

- Blade Improvement



Potential Design Improvements

- Blade Improvement



Lightly score but don't
cut along the dotted
lines, then bend slightly
(to around 10 degrees)

Design Suggestion - Moulds

Different mould shapes
can be made according
to taste/planned use

E.g. moulds could be
made to make bricks
instead of floor tiles