

IDP - Mechanical documentation

Team L212: The Seven Deadly Trins

Trinity College

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21 March 2021

1 Material Choice

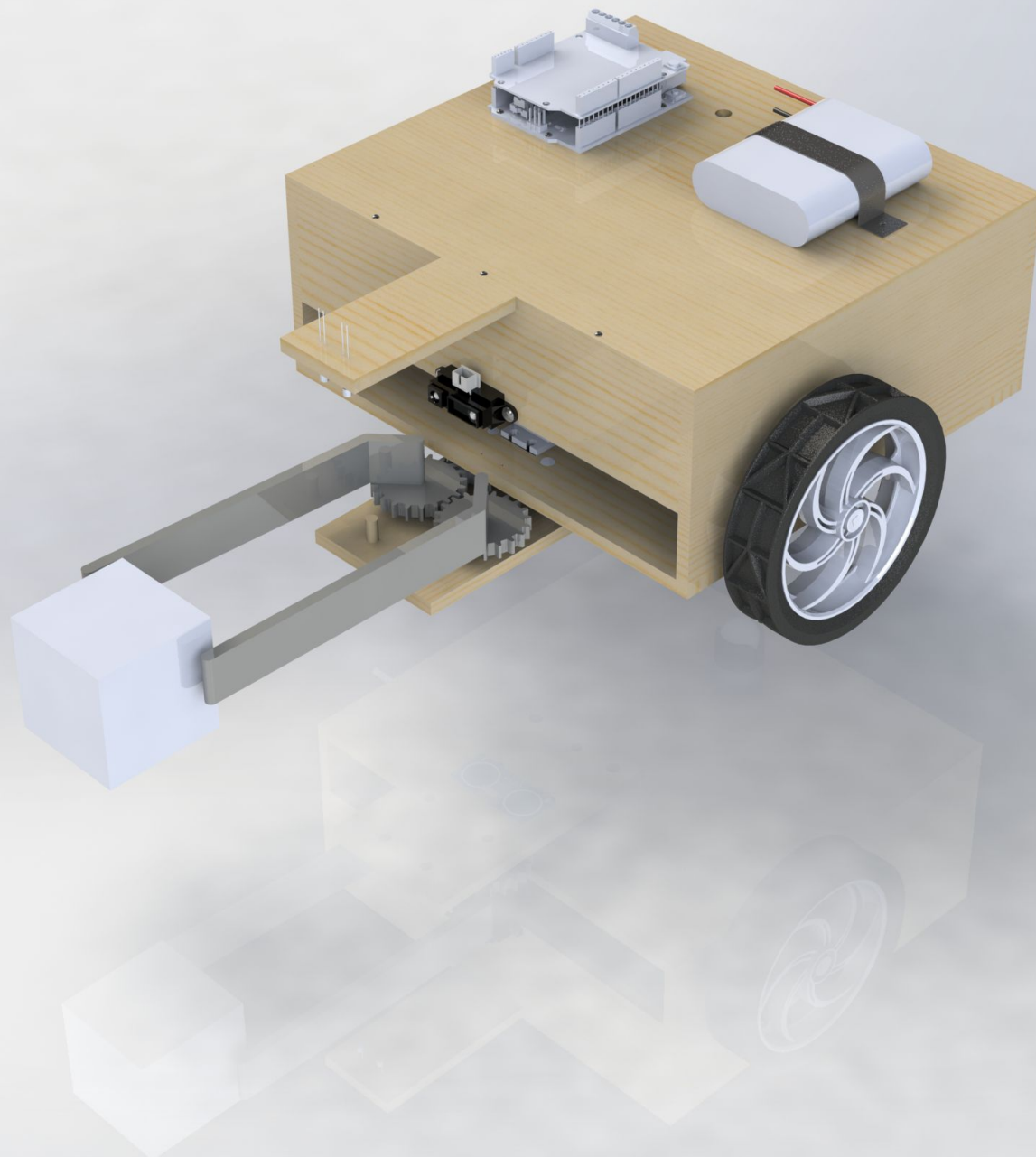
- 6mm thick MDF wood
- PLA
- 0.7mm thick sheet metal

2 Material Justification

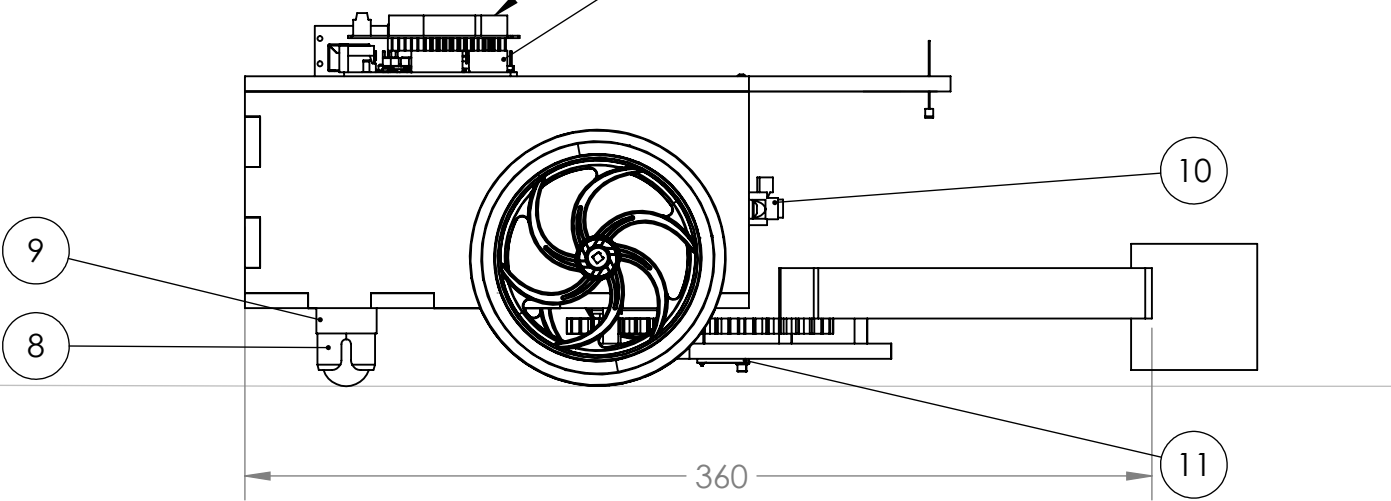
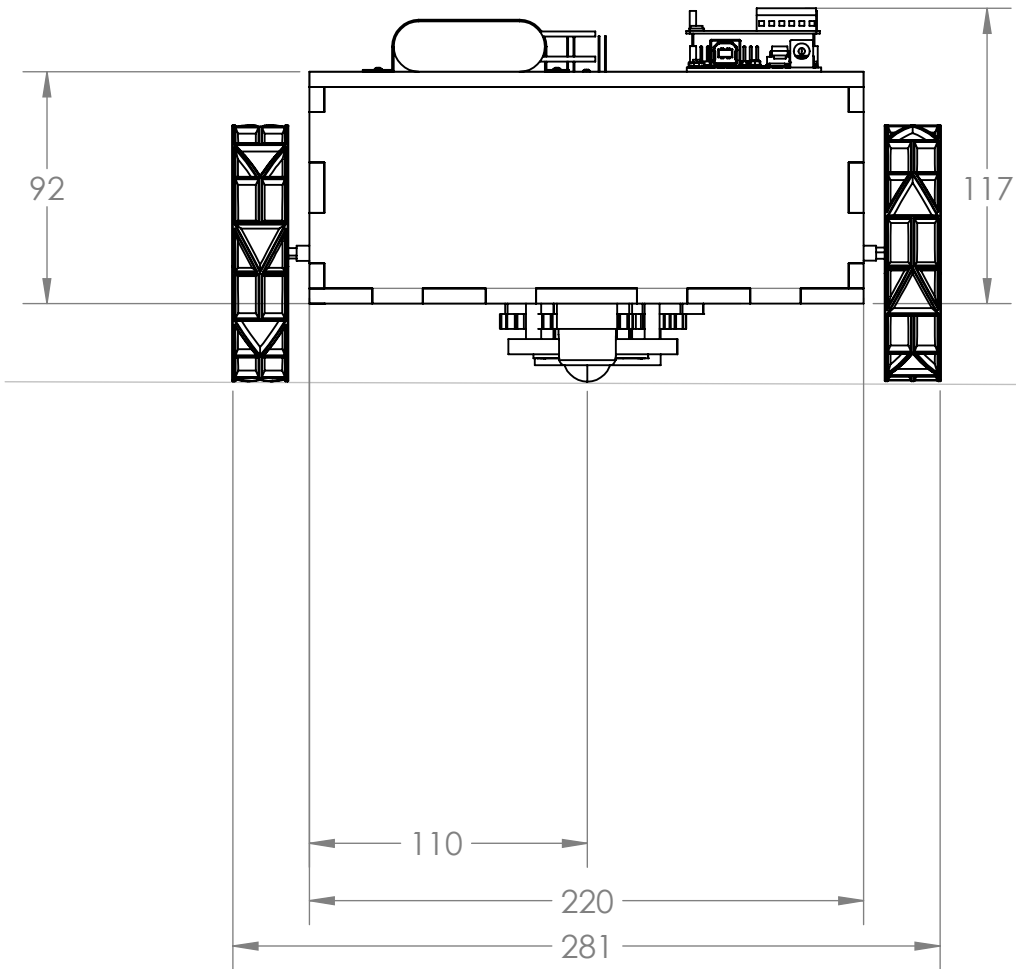
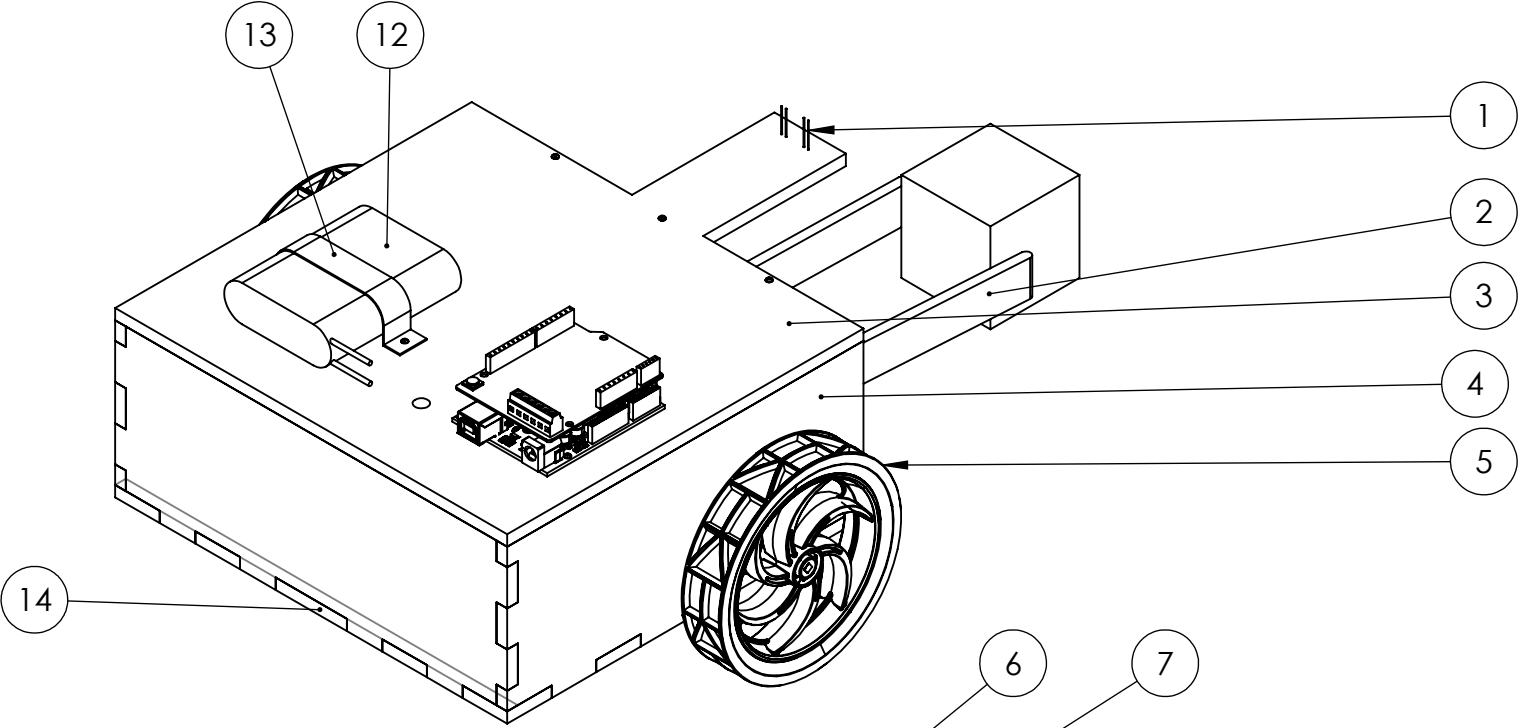
- Main goal was to create a simple and easy to manufacture robot
- Wood used for the main body of the robot since it is easy to laser cut and put together
- Comb joints are used here to increase the strength of the robot and are put together with wood glue. 6mm thick wood used to further increase the structural stability of the robot as it is the thickest material available
- Sheet metal used for the brackets as it is easier to work with the bends
- Use of PLA and 3D printing for parts which cannot be manufactured as easily with either wood or sheet metal

3 Manufacturing

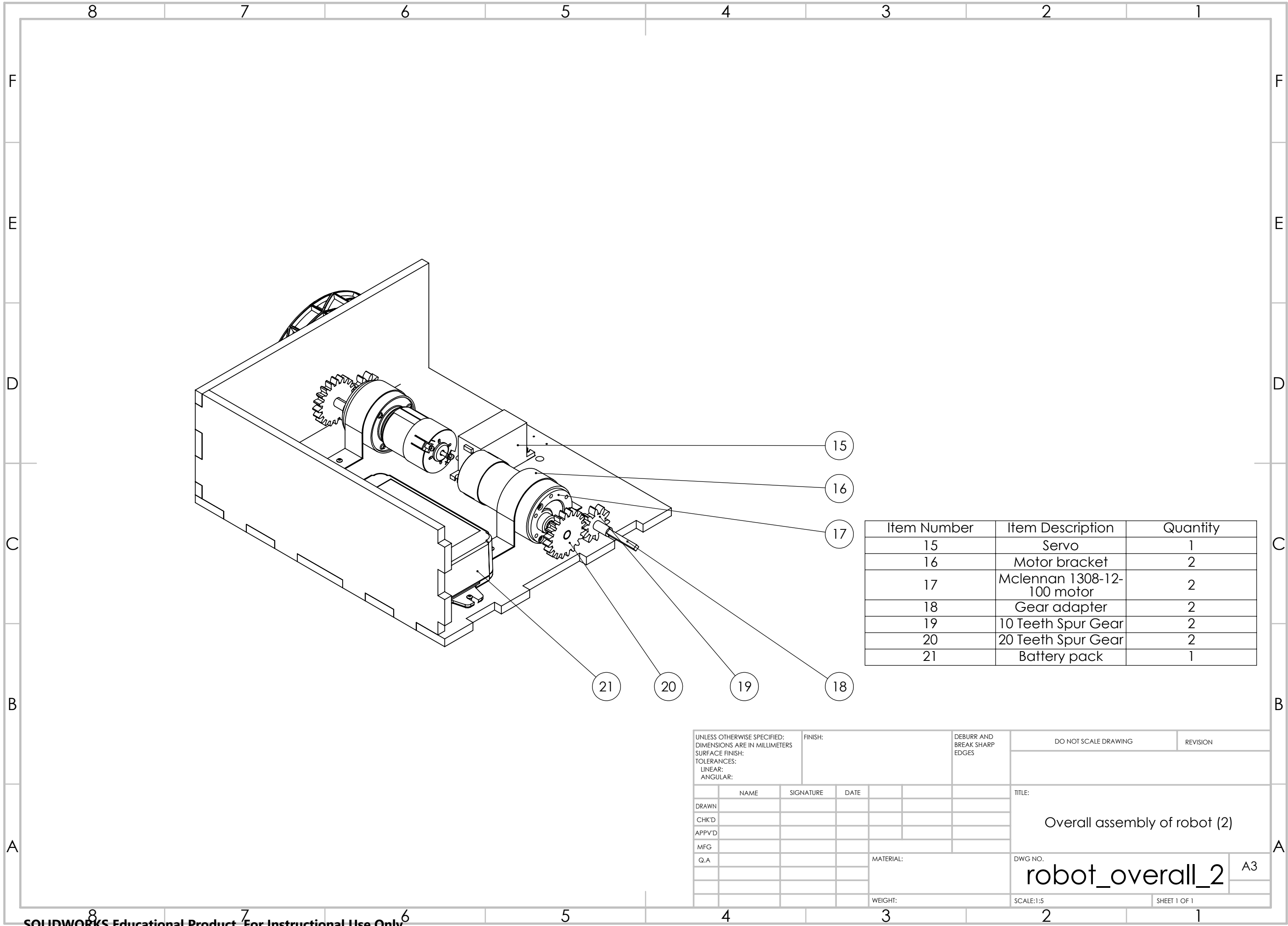
- Robot is laser cut via the dxf files (end of handout) on 6mm thick MDF wood and 0.7mm sheet metal
- Wood glue used for the main body of the robot
- Additional holes which need to be drilled are marked on the drawings
- Sensors and other components are bolted to the robot in the positions shown in the drawings / renders
- Holes in the 3D printed drawing are threaded



Item Number	Description	Quantity
1	TEPT4400	2
2	Servo grip	1
3	Top lid	1
4	Side panel	2
5	4 inch wheel	2
6	Motor shield	1
7	Arduino	1
8	Ball bearing castor	1
9	Ball bearing mount	1
10	IR sensor	1
11	Ultrasonic sensor	1
12	Battery pack	1
13	Battery pack mount	1
14	Bottom panel	1

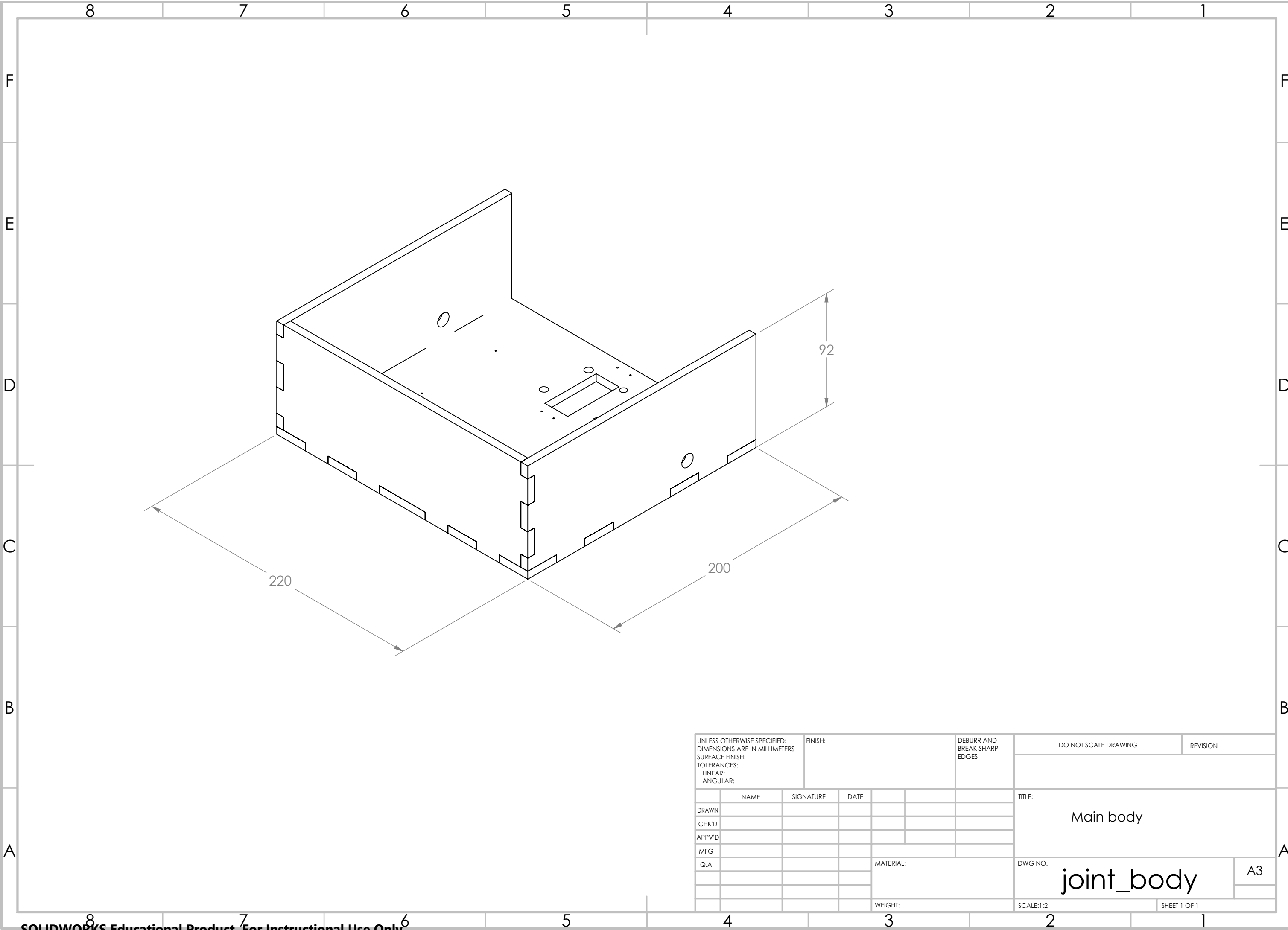


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN				NAME		SIGNATURE		DATE		TITLE:	
CHK'D										Overall assembly of robot (1)	
APPV'D										DWG NO.	
MFG										overall_robot_1	
Q.A										A3	
										SCALE:1:5	
										SHEET 1 OF 1	

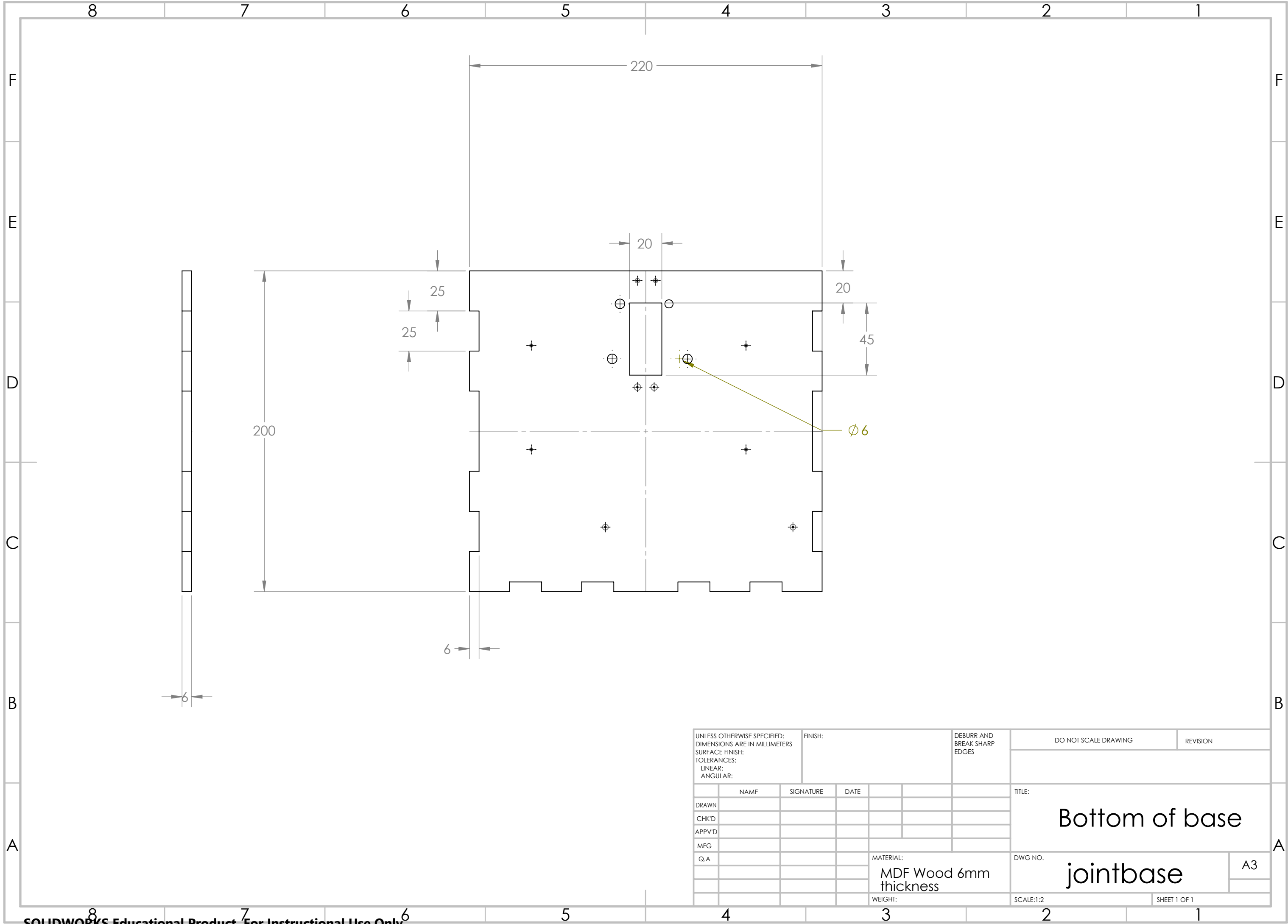


Item Number	Item Description	Quantity
15	Servo	1
16	Motor bracket	2
17	Mclennan 1308-12-100 motor	2
18	Gear adapter	2
19	10 Teeth Spur Gear	2
20	20 Teeth Spur Gear	2
21	Battery pack	1

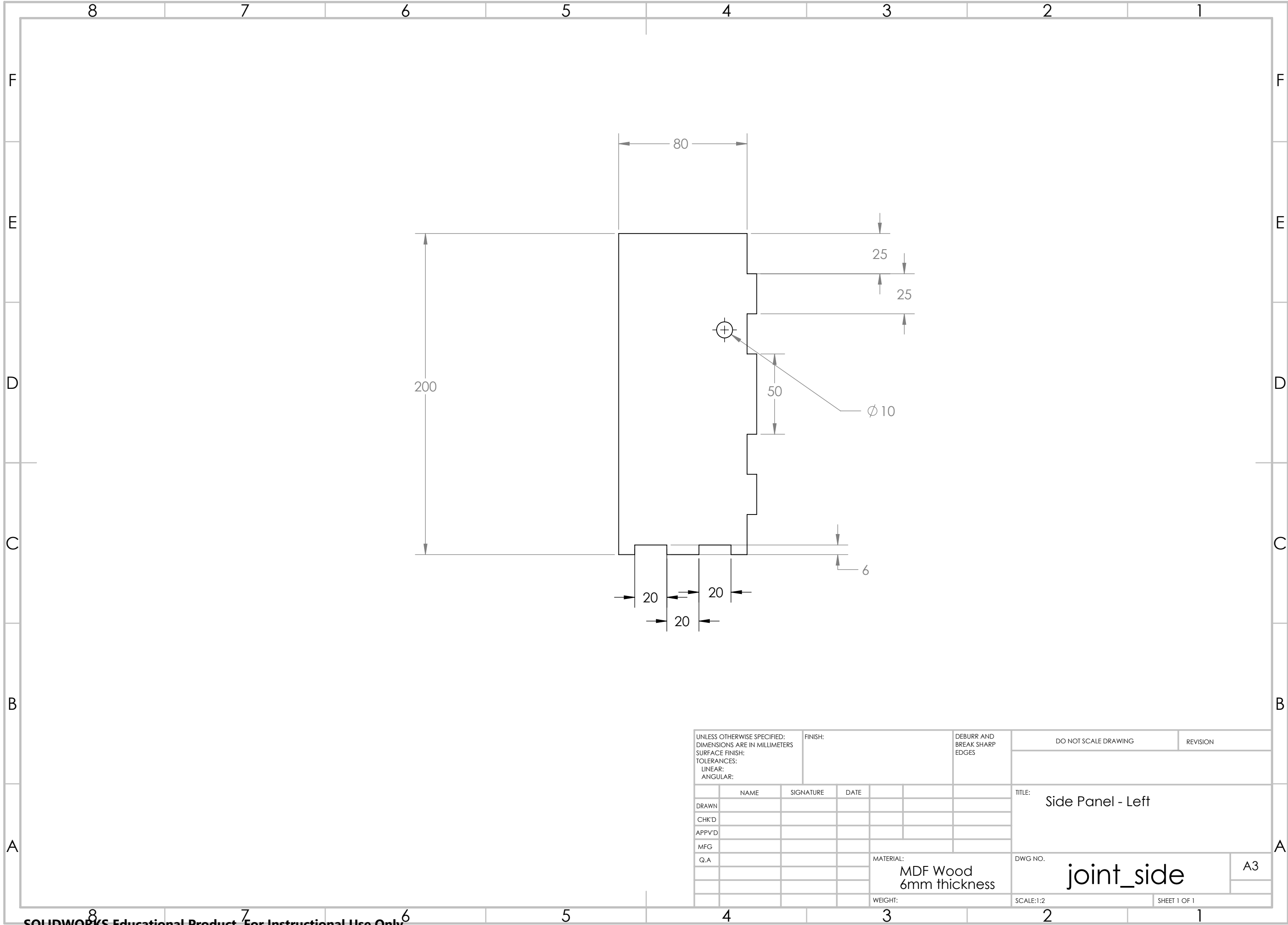
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DRAWN				NAME		SIGNATURE		DATE		TITLE: Overall assembly of robot (2)	
CHK'D											
APPV'D											
MFG											
Q.A											
								MATERIAL:		DWG NO. robot_overall_2	
								WEIGHT:		SCALE:1:5	
										SHEET 1 OF 1	



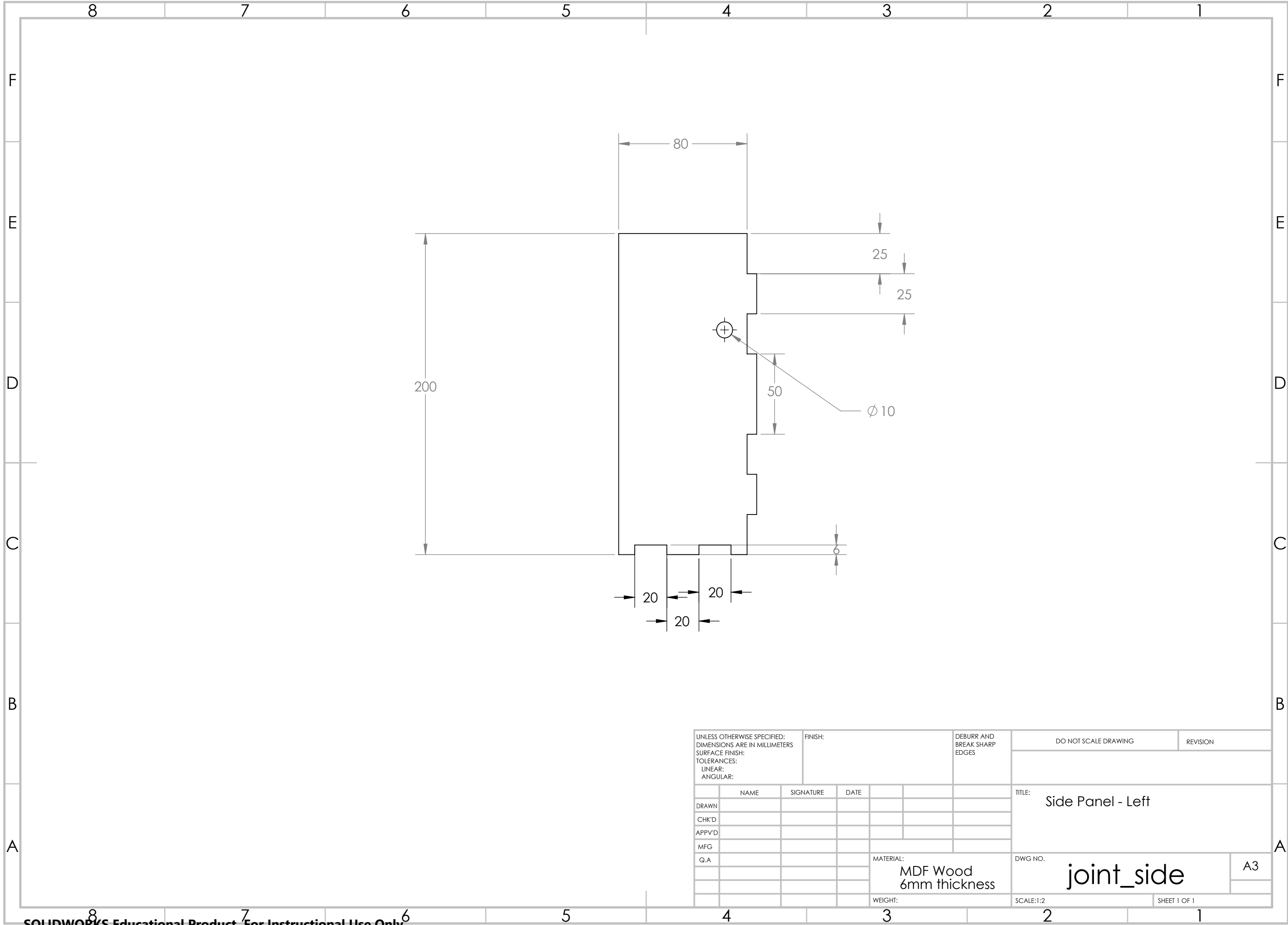
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	NAME	SIGNATURE	DATE				TITLE: Main body				
DRAWN							DWG NO. joint_body				
CHK'D											
APPV'D											
MFG											
Q.A							MATERIAL:		A3		
							WEIGHT:		SCALE:1:2		
									SHEET 1 OF 1		



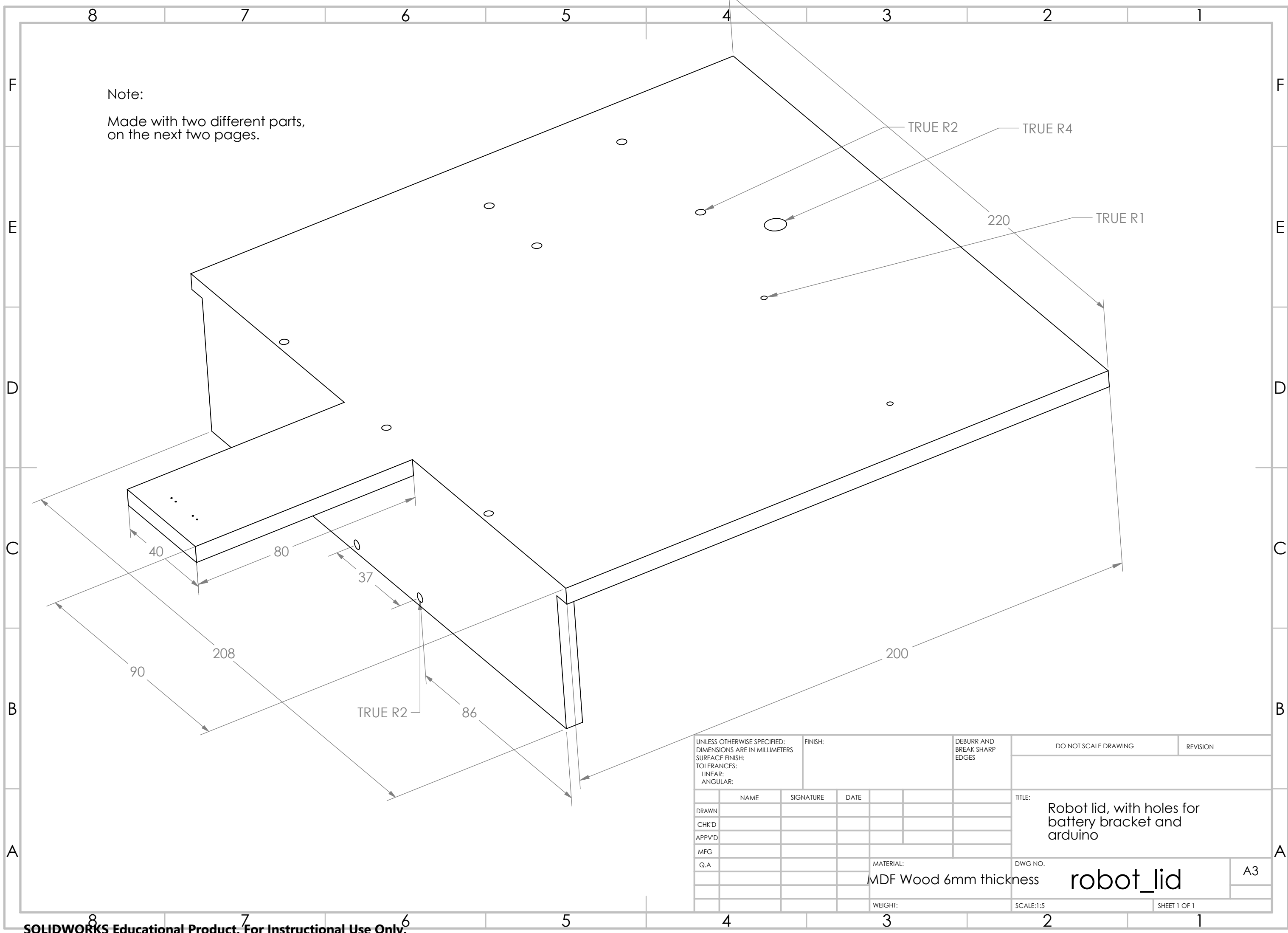
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	NAME		SIGNATURE		DATE						TITLE: Bottom of base				
DRAWN															
CHK'D															
APPV'D															
MFG															
Q.A						MATERIAL: MDF Wood 6mm thickness				DWG NO.		jointbase		A3	
						WEIGHT:				SCALE:1:2		SHEET 1 OF 1			



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:			DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING	REVISION
	NAME	SIGNATURE	DATE						TITLE: Side Panel - Left	
DRAWN										
CHK'D										
APPV'D										
MFG										
Q.A									DWG NO. joint_side	
									SHEET 1 OF 1	
									A3	
									SCALE:1:2	
									MATERIAL: MDF Wood 6mm thickness	
									WEIGHT:	



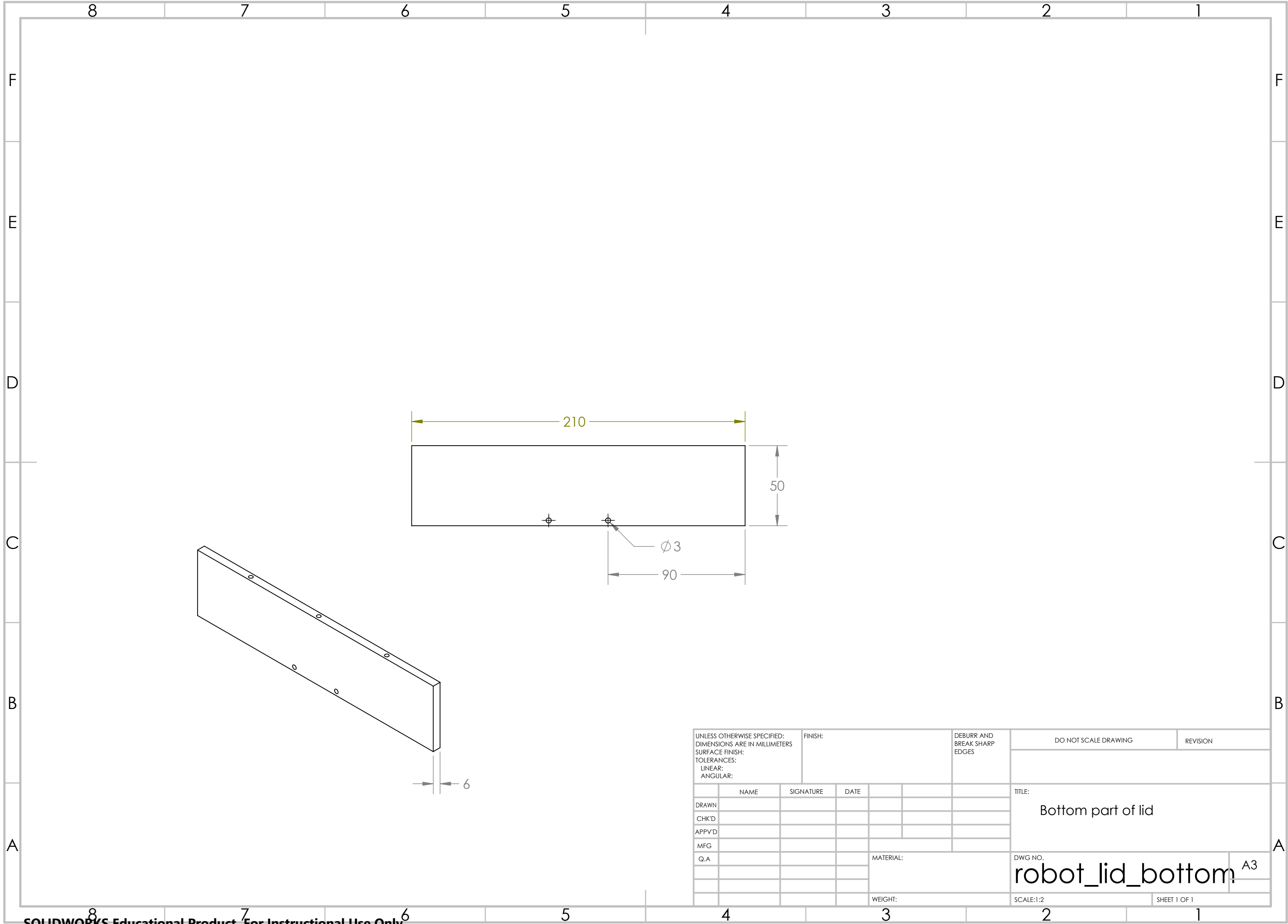
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	NAME	SIGNATURE	DATE						TITLE: Side Panel - Left		
DRAWN											
CHK'D											
APPV'D											
MFG											
Q.A									DWG NO. joint_side		A3
									SCALE:1:2		
									SHEET 1 OF 1		



Note:

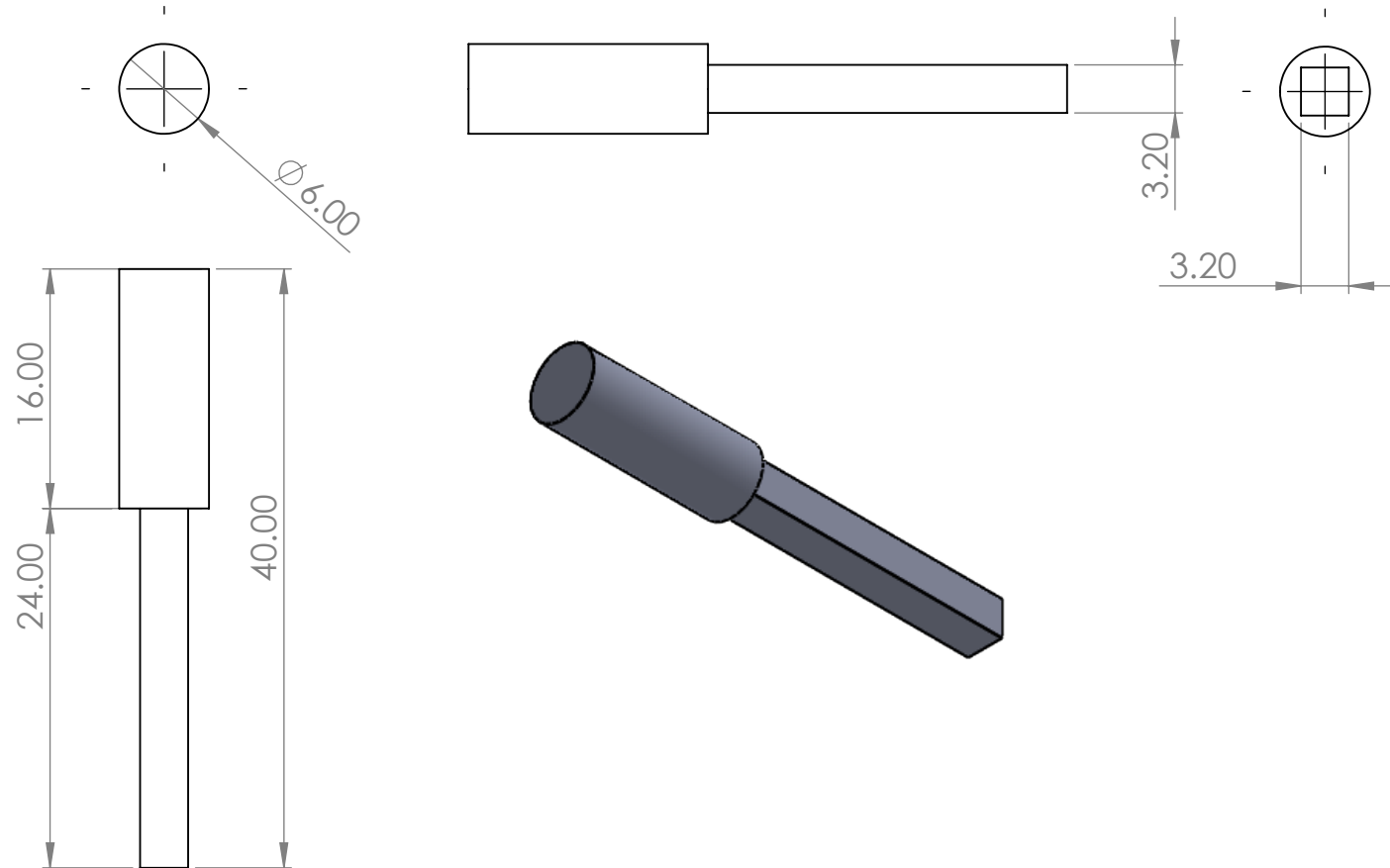
Made with two different parts,
on the next two pages.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING		REVISION			
							TITLE: Robot lid, with holes for battery bracket and arduino					
DRAWN												
CHK'D												
APPV'D												
MFG												
Q.A						MATERIAL:		DWG NO.				A3
						MDF Wood 6mm thickness		robot_lid				
						WEIGHT:		SCALE:1:5				SHEET 1 OF 1

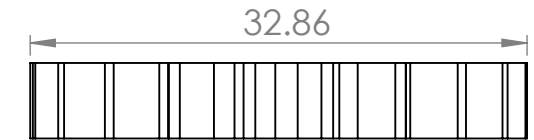


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	NAME	SIGNATURE	DATE				TITLE: Bottom part of lid		
DRAWN									
CHK'D									
APPV'D									
MFG									
Q.A						MATERIAL:	DWG NO. robot_lid_bottom		A3
						WEIGHT:	SCALE:1:2		SHEET 1 OF 1

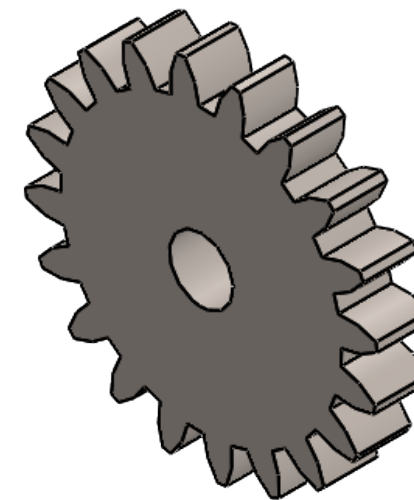
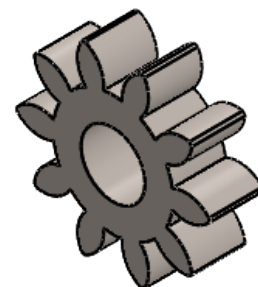
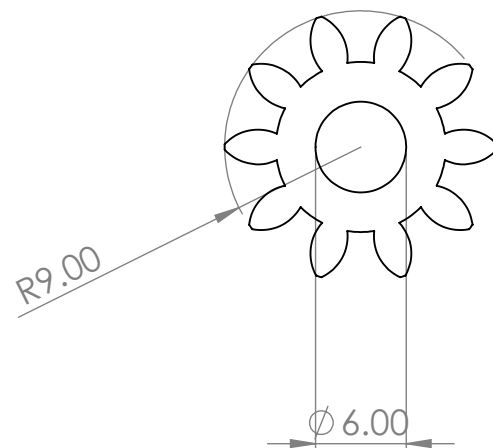
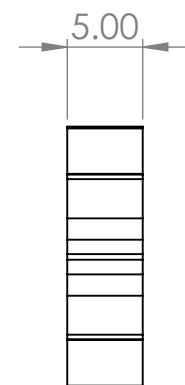
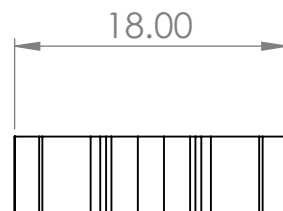
Gear-to-Wheel Adapter



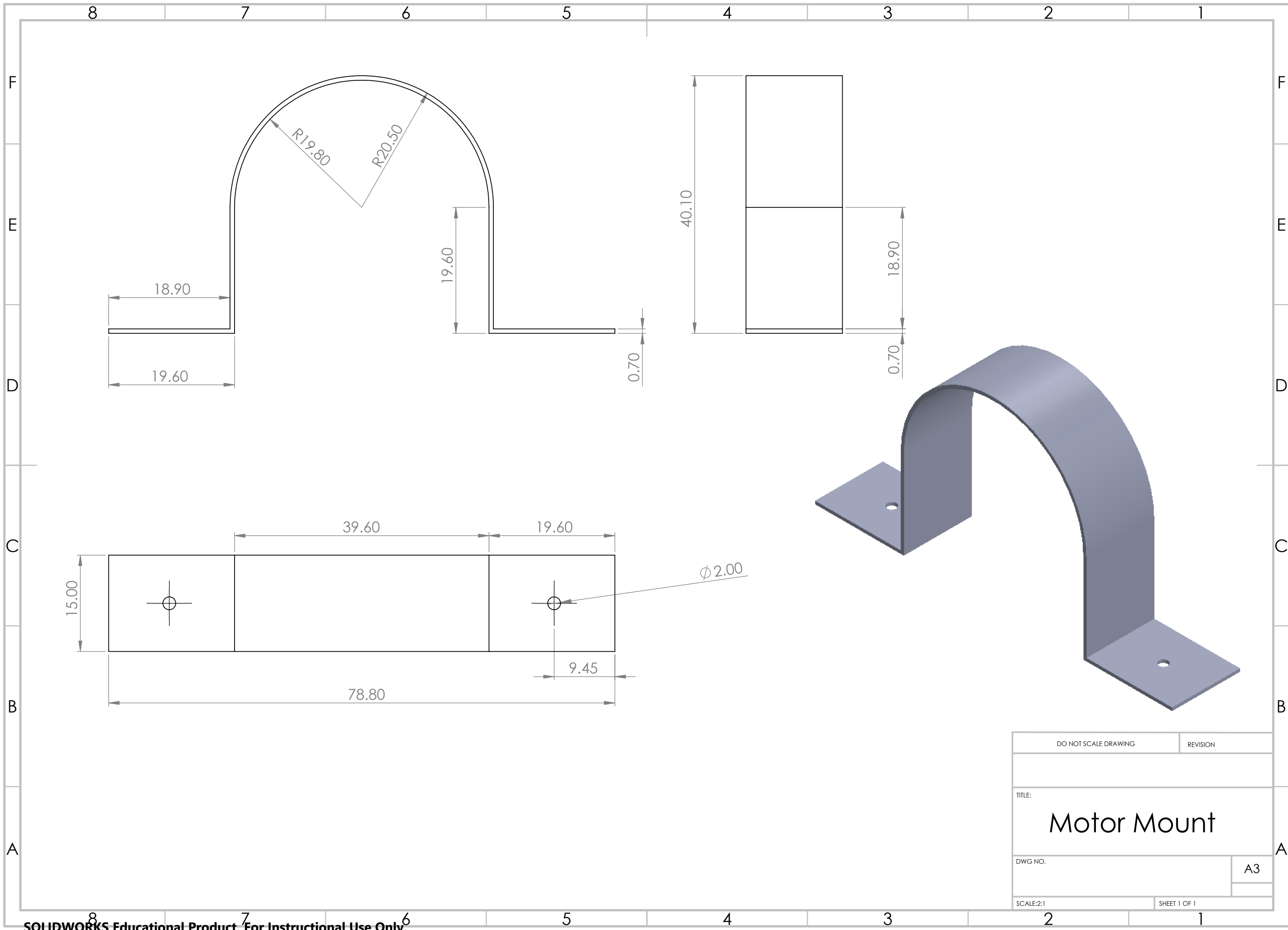
20 Teeth Spur Gear



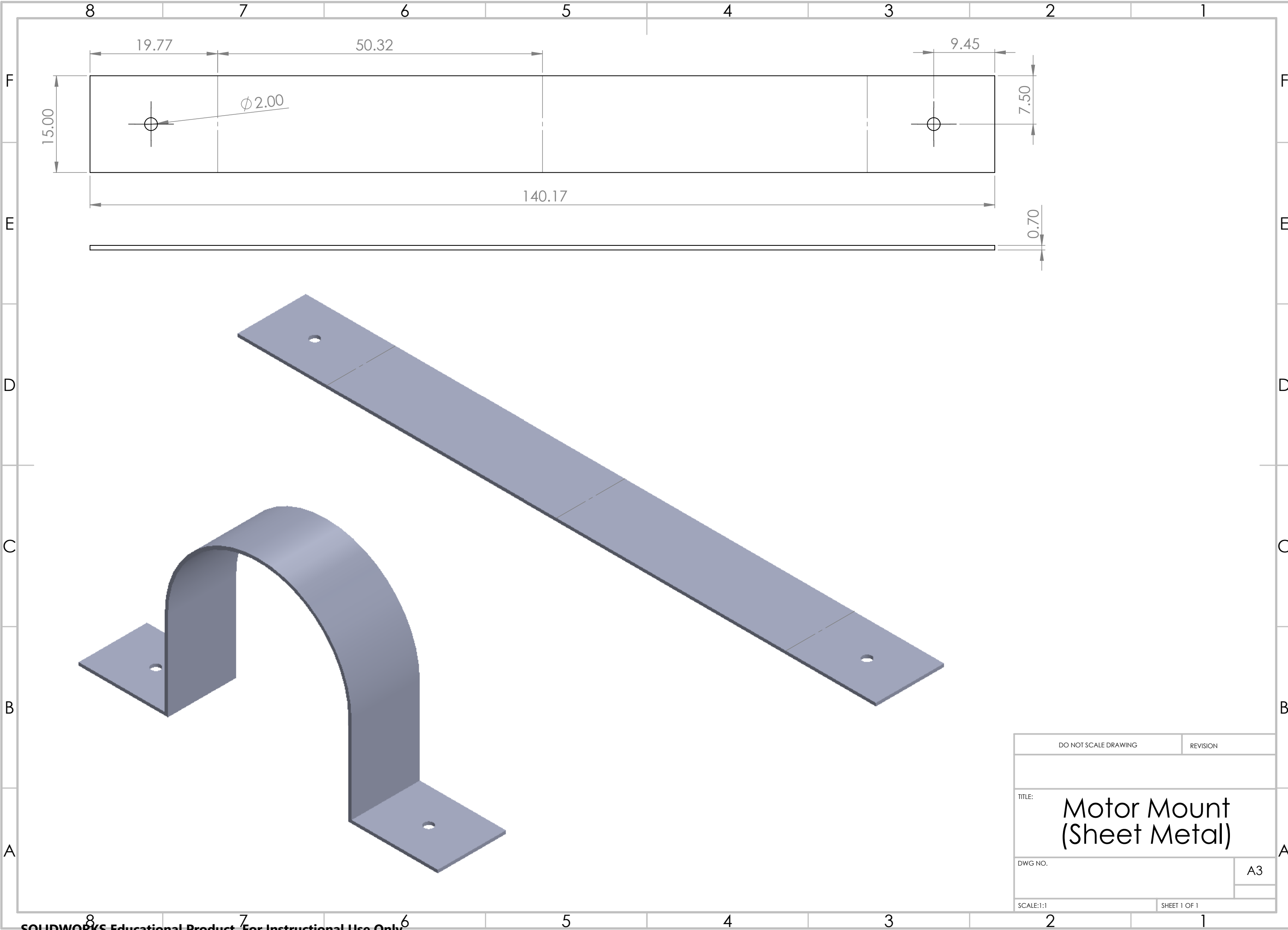
10 Teeth Spur Gear



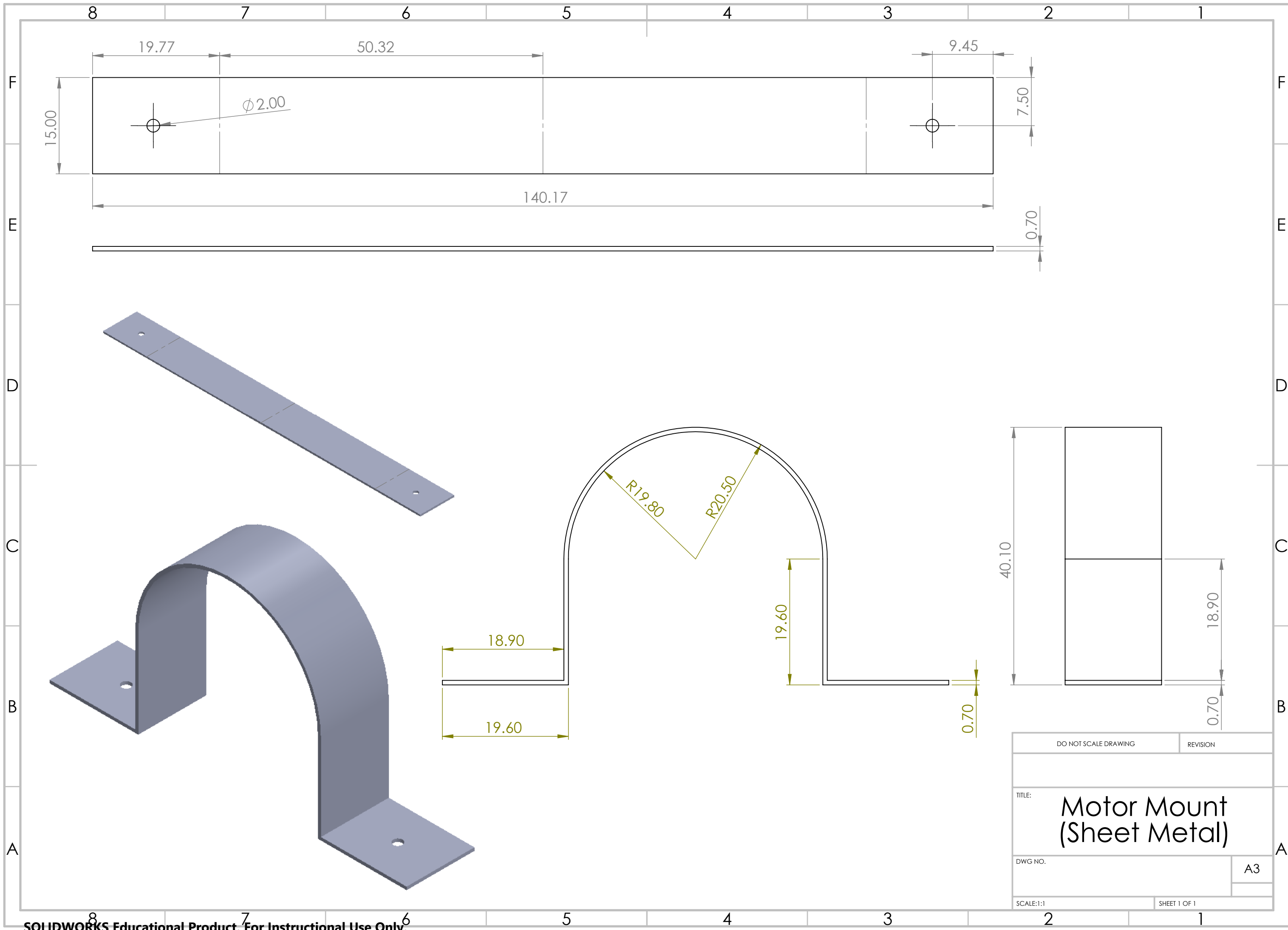
DO NOT SCALE DRAWING		REVISION	
TITLE: Gear-to-Wheel Adapter, 10 Teeth Spur Gear & 20 Teeth Spur Gear			
DWG NO.			A3
SCALE:2:1		SHEET 1 OF 1	



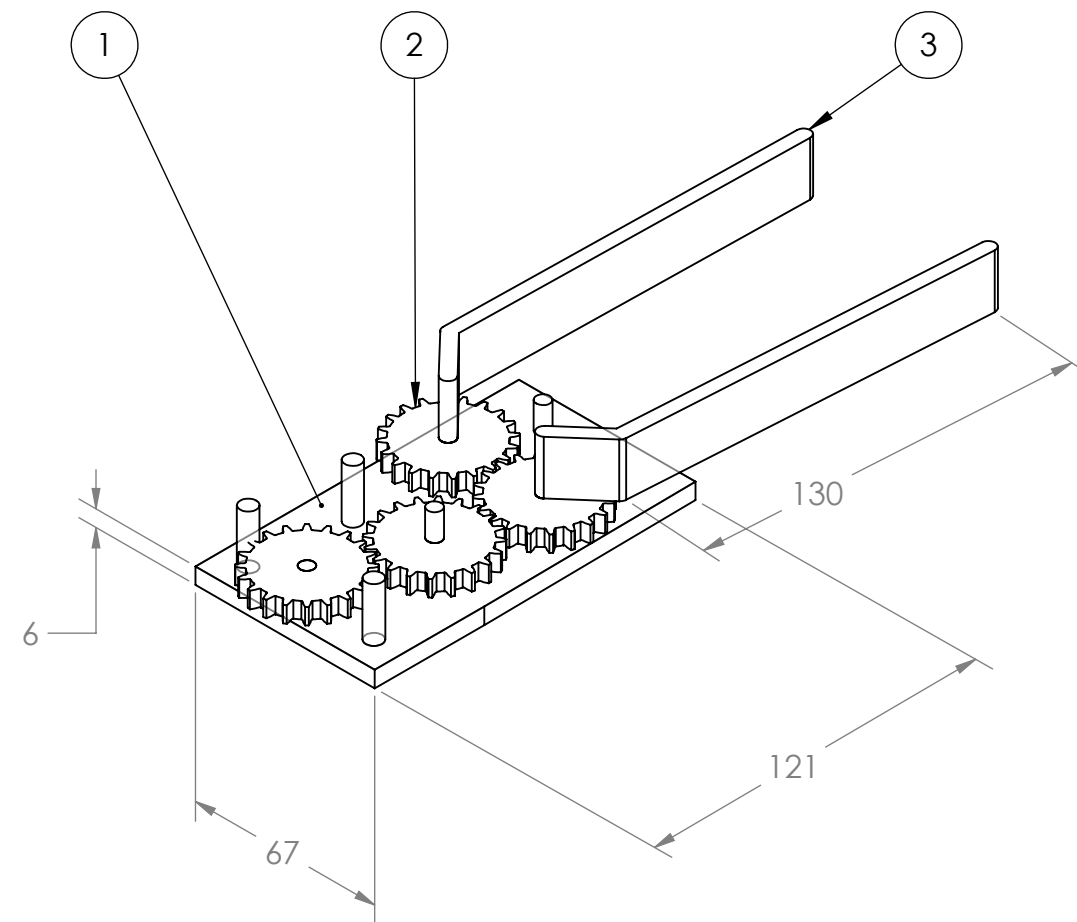
DO NOT SCALE DRAWING		REVISION	
TITLE:			
Motor Mount			
DWG NO.			A3
SCALE:2:1		SHEET 1 OF 1	

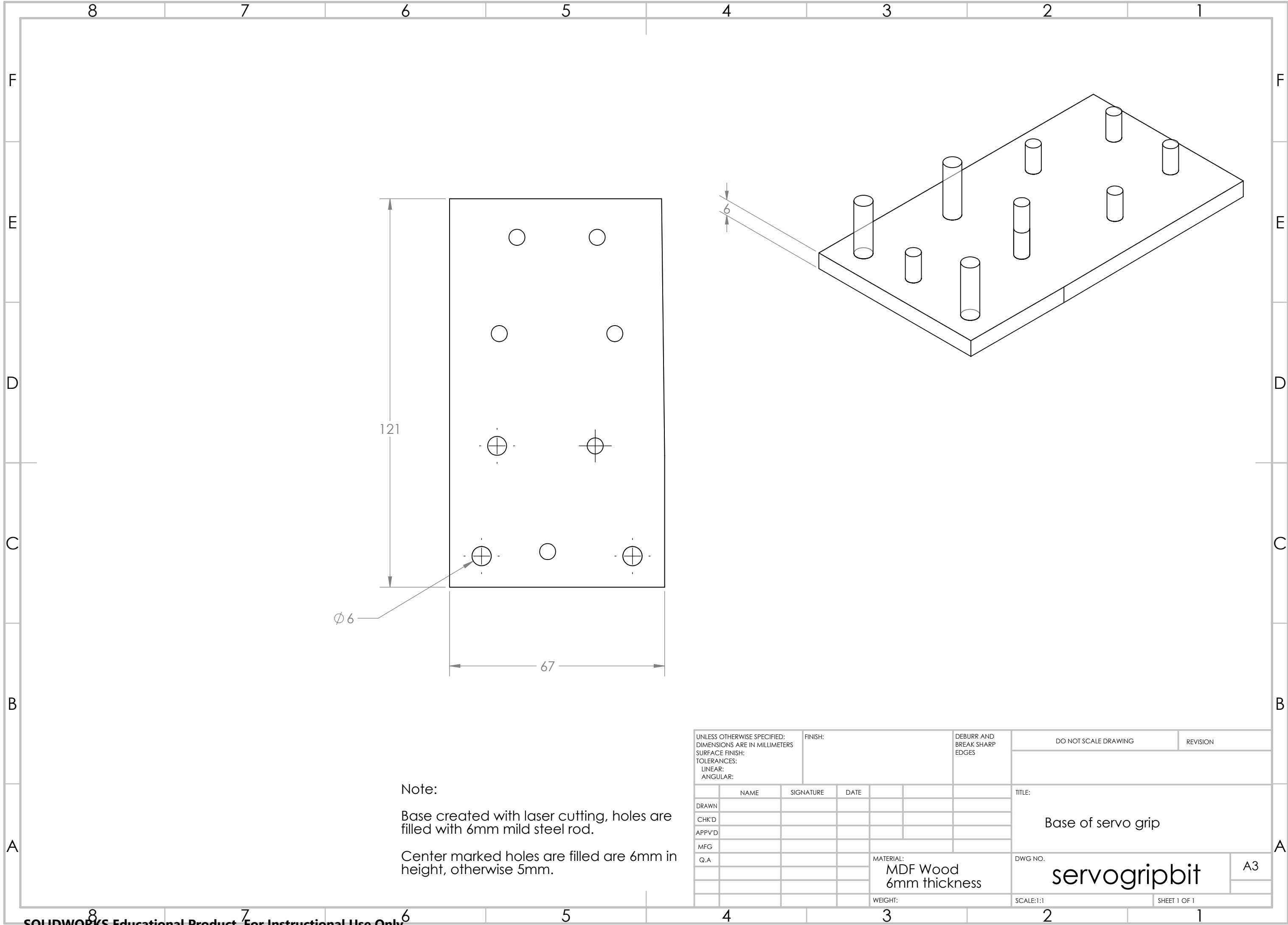


DO NOT SCALE DRAWING		REVISION	
TITLE: Motor Mount (Sheet Metal)			
DWG NO.			A3
SCALE:1:1		SHEET 1 OF 1	



DO NOT SCALE DRAWING		REVISION	
TITLE: Motor Mount (Sheet Metal)			
DWG NO.			A3
SCALE:1:1		SHEET 1 OF 1	

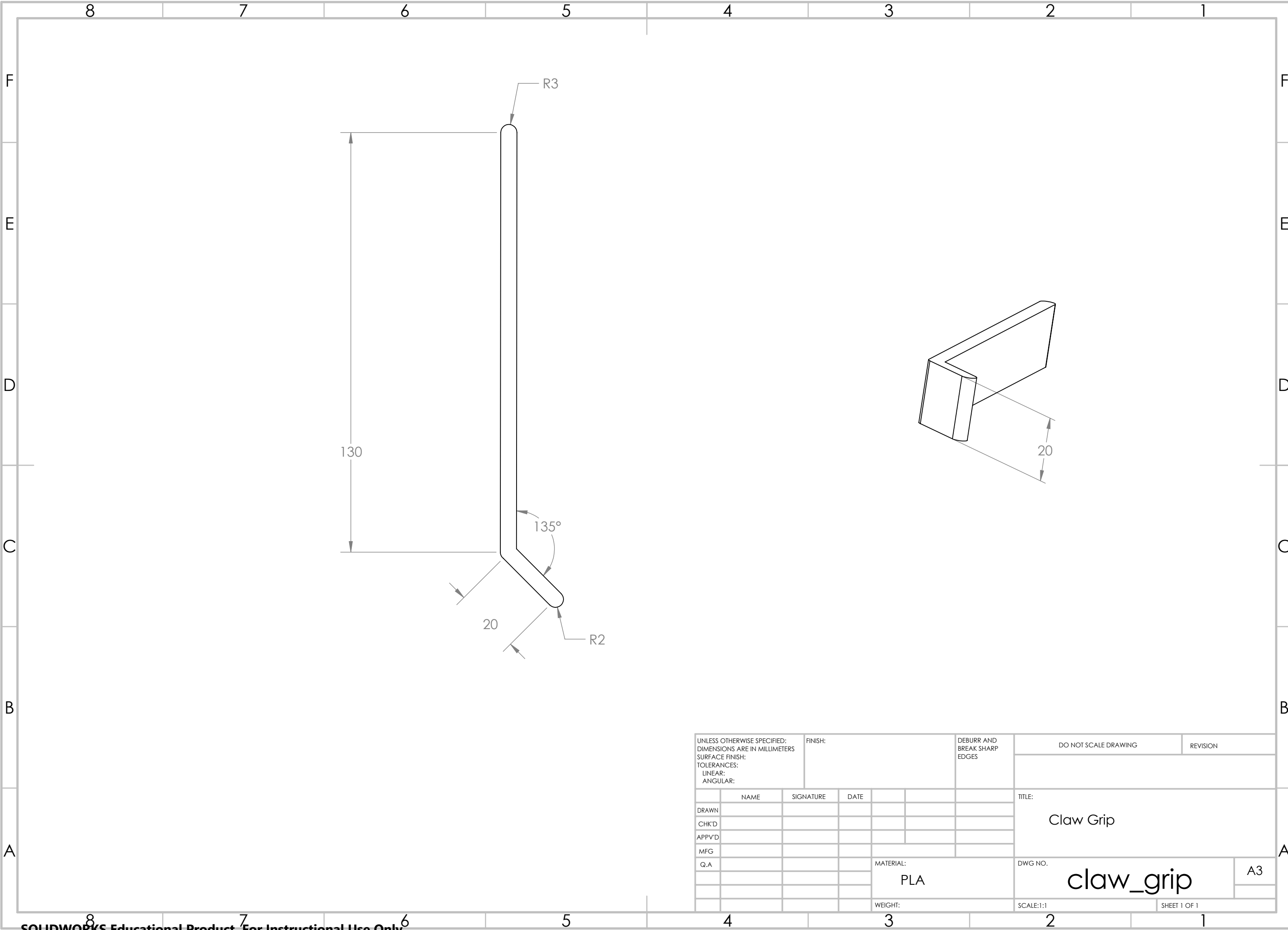




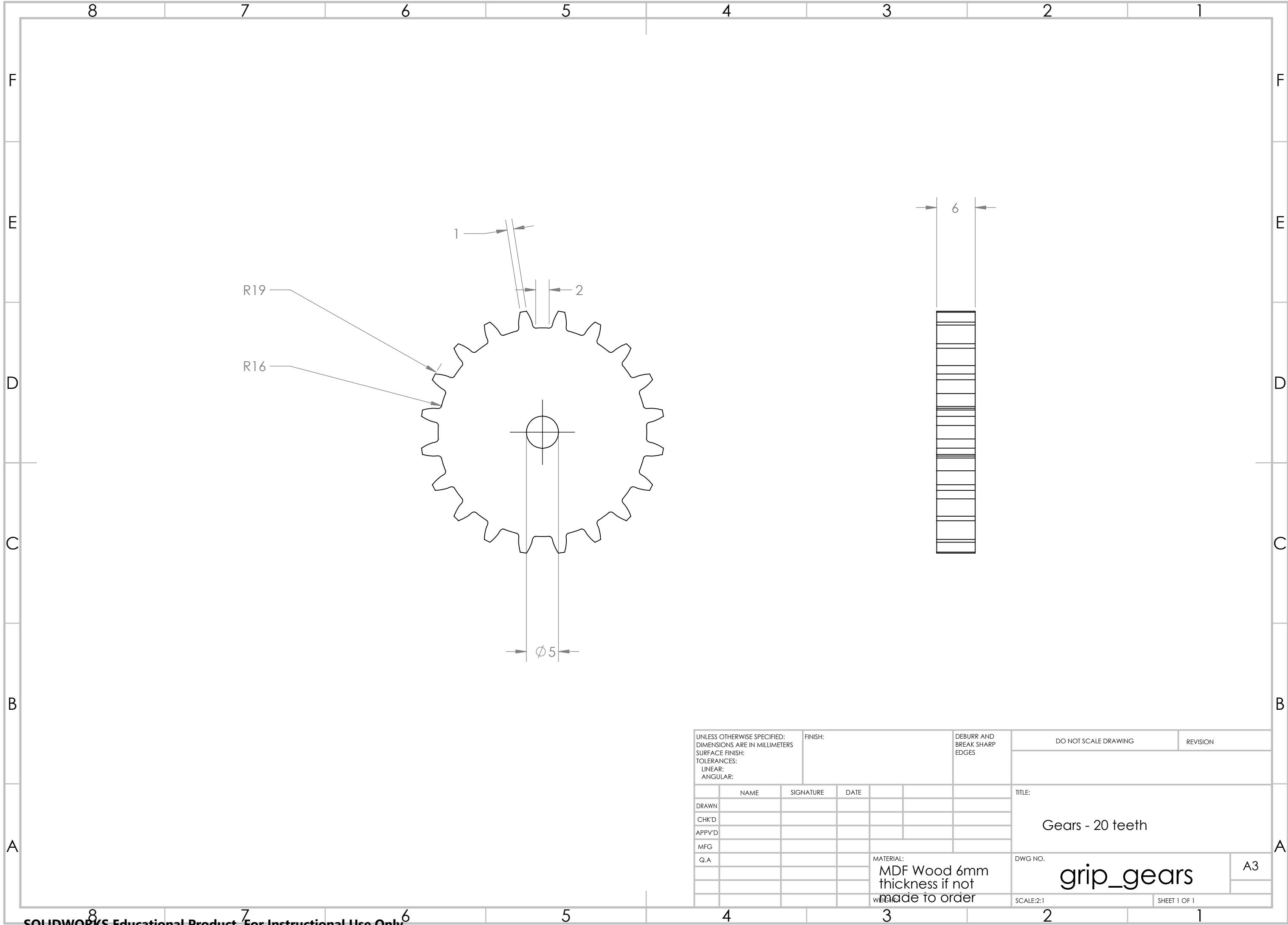
Note:

Base created with laser cutting, holes are filled with 6mm mild steel rod.

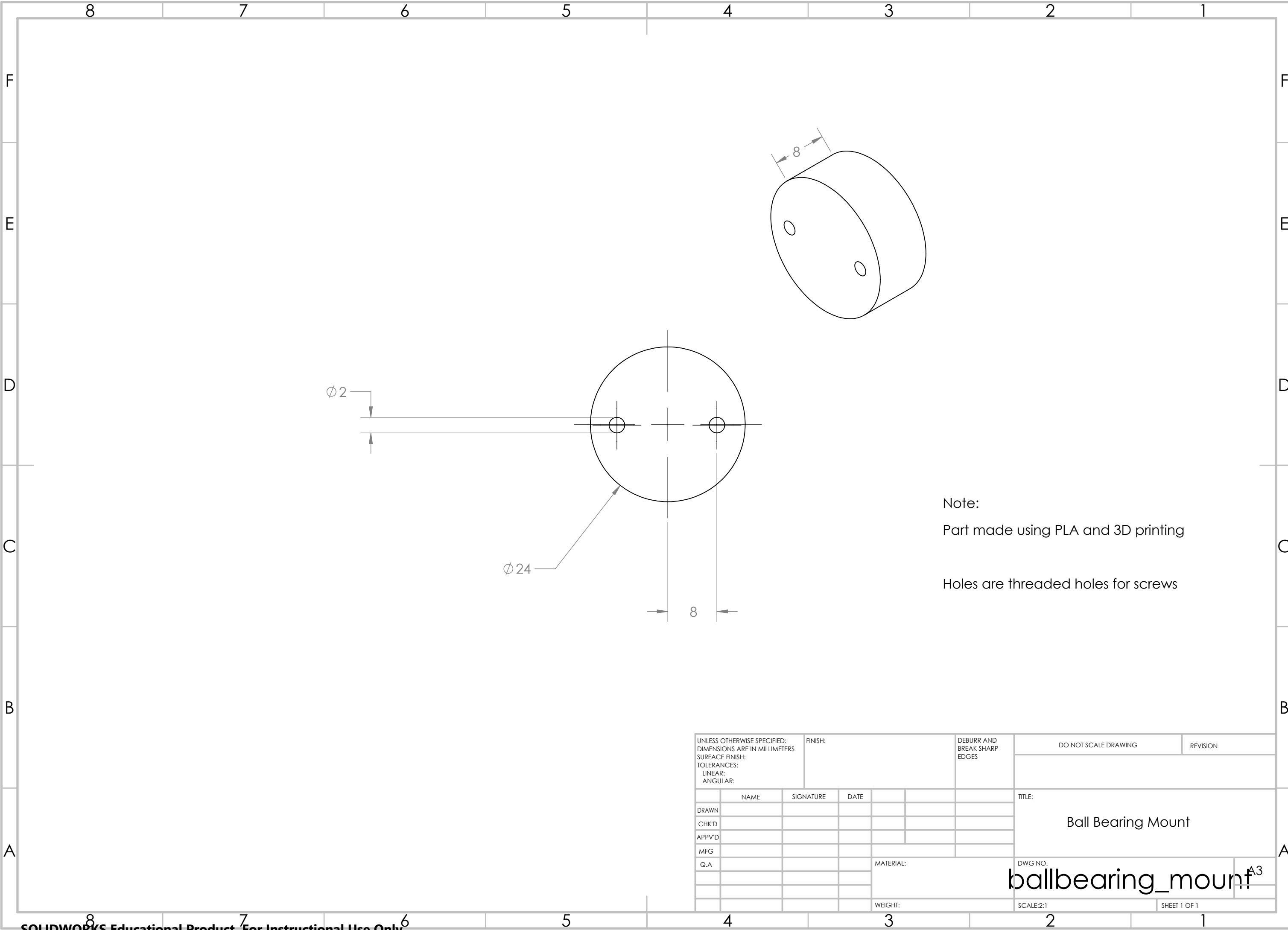
Center marked holes are filled are 6mm in height, otherwise 5mm.



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING		REVISION
	NAME	SIGNATURE	DATE				TITLE: Claw Grip		
DRAWN									
CHK'D									
APPV'D									
MFG							DWG NO. claw_grip		
Q.A									
							SCALE:1:1		
							SHEET 1 OF 1		



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:				FINISH:		DEBURR AND BREAK SHARP EDGES	DO NOT SCALE DRAWING		REVISION
	NAME	SIGNATURE	DATE				TITLE: Gears - 20 teeth		
DRAWN									
CHK'D									
APPV'D									
MFG									
Q.A							DWG NO.		A3
							SCALE:2:1		SHEET 1 OF 1



Note:
Part made using PLA and 3D printing

Holes are threaded holes for screws

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:						FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING			REVISION	
	NAME		SIGNATURE		DATE					TITLE: Ball Bearing Mount				
DRAWN														
CHK'D														
APP'V'D														
MFG														
Q.A							MATERIAL:			DWG NO. ballbearing_mount			A3	
							WEIGHT:			SCALE:2:1			SHEET 1 OF 1	

