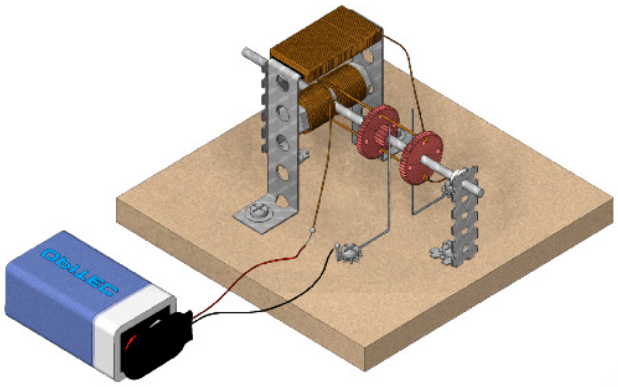
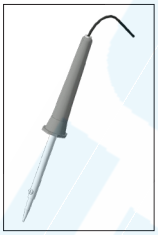
124,867

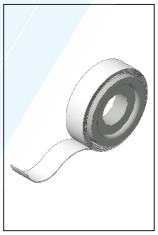
DC/AC electric motor

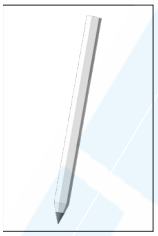


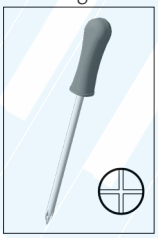
Tools Needed:

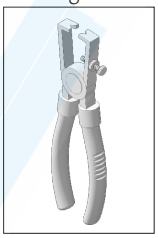

soldering iron


Prickling Awl

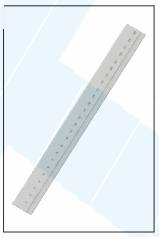

duct tape


Pencil


Screwdriver

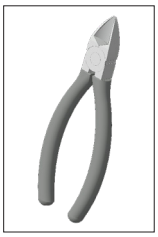

Insulated Wire Strippers

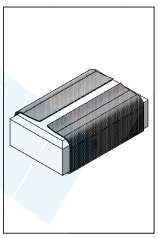

PUK saw


Ruler


wrench

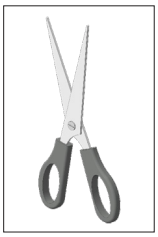

Pliers


side cutter


abrasive paper


File


Superglue


Scissors

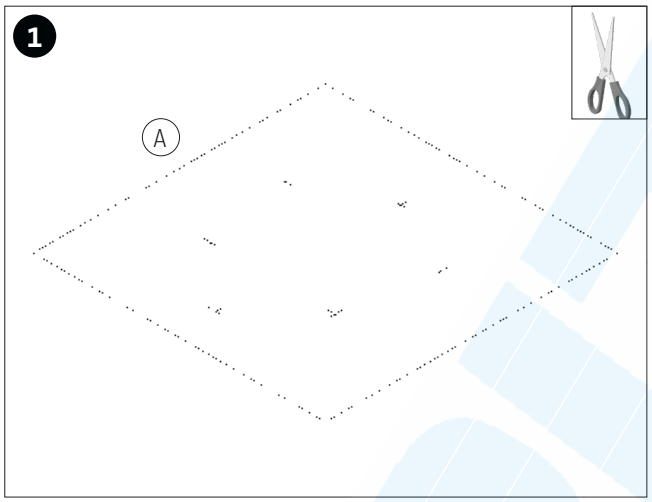
Please note:

After completion, the OPITEC factory packs are not toys that are generally commercially available, but teaching and learning materials to support educational work. This kit may only be built and operated by children and young people under the guidance and supervision of knowledgeable adults. Not suitable for children under 36 months. Danger of suffocation!

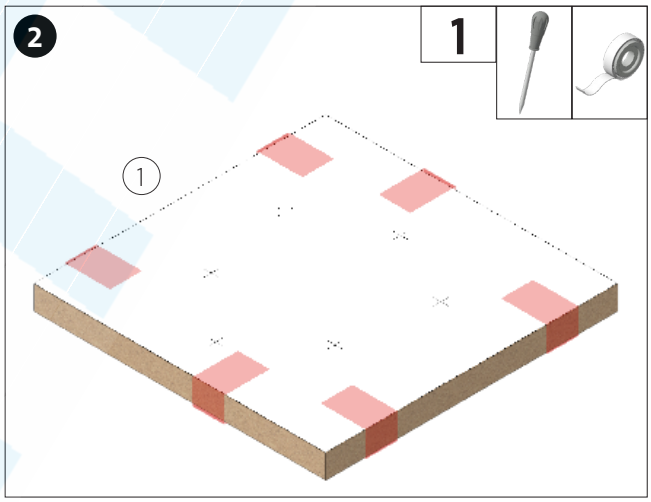
parts list	quantity	Dimensions (mm)	Description	Part-No.
MDF board	1	100x100x10	Base plate	1
Square Perforated Plate	1	150/100x10x0.5	Storage	2
perforated tape strips	1	180x12	carrier coil	3
Metal Axis	1	ø3x95	Axis	4
double gear	2	30/10	Gear wheel	5
Hex head screw with nut	1		Screw	6
Enamelled copper wire	1	ø0.5x2500	wire	7
spring steel wire	1	0.5x250	sliding contact	8
Washer	2	9/4.3	Washer	9
toothed washer	6	M4	toothed washer	10

OPITEC

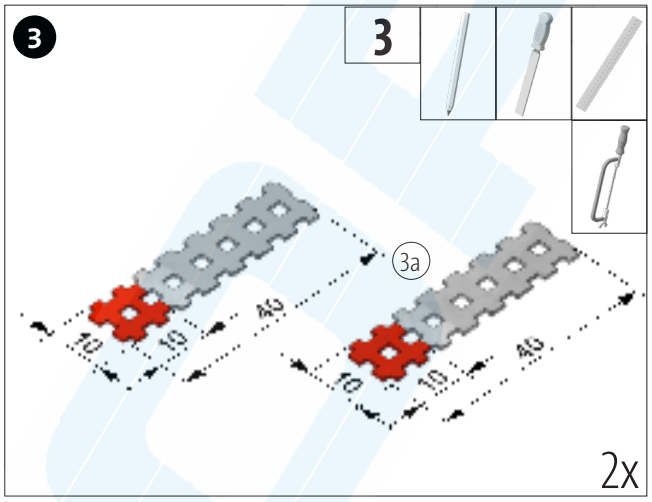
parts list	quantity	Dimensions (mm)	Description	Part-No.
Battery clip 9V	1		Connection battery	11
Tapping Screw	6		Fastening	12
Spacer	2	2.9	Fastening	13



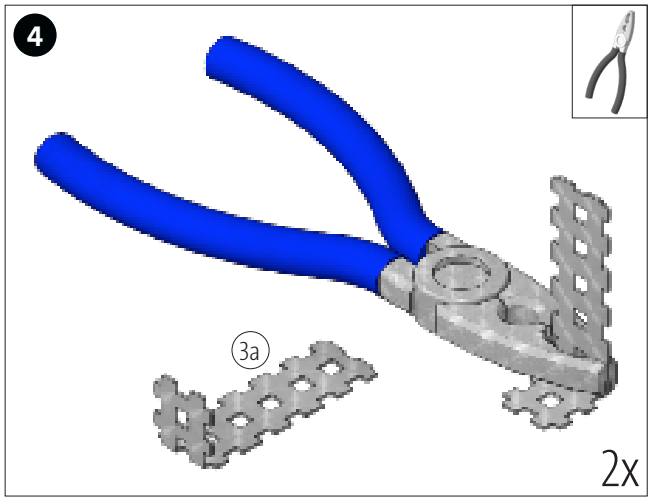
Cut out the template (A).



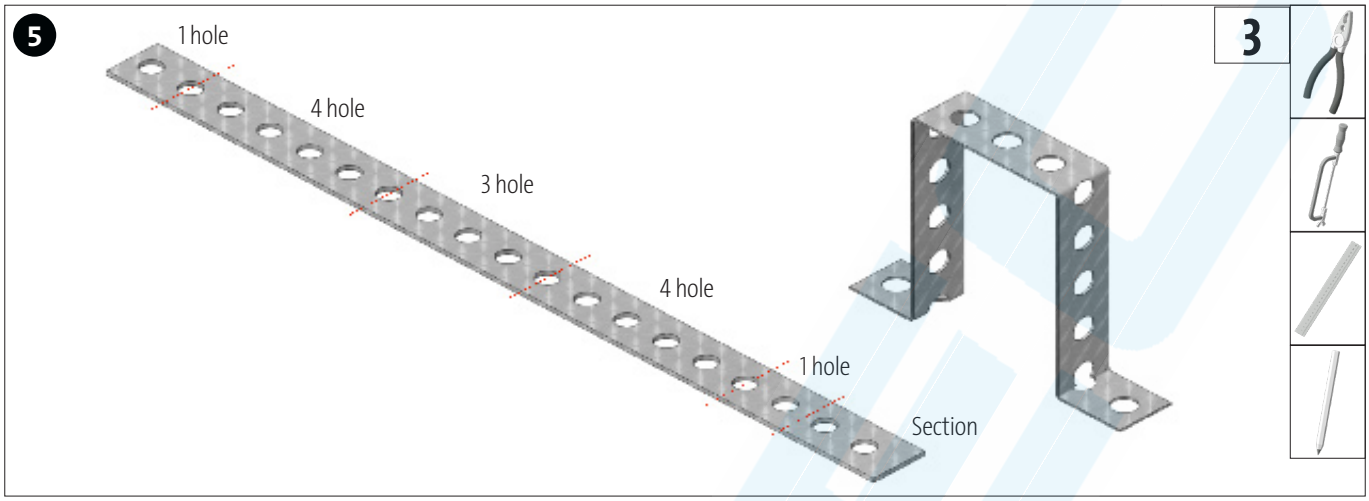
Glue the template (A) to the base plate (1) and pre-punch the screw positions.



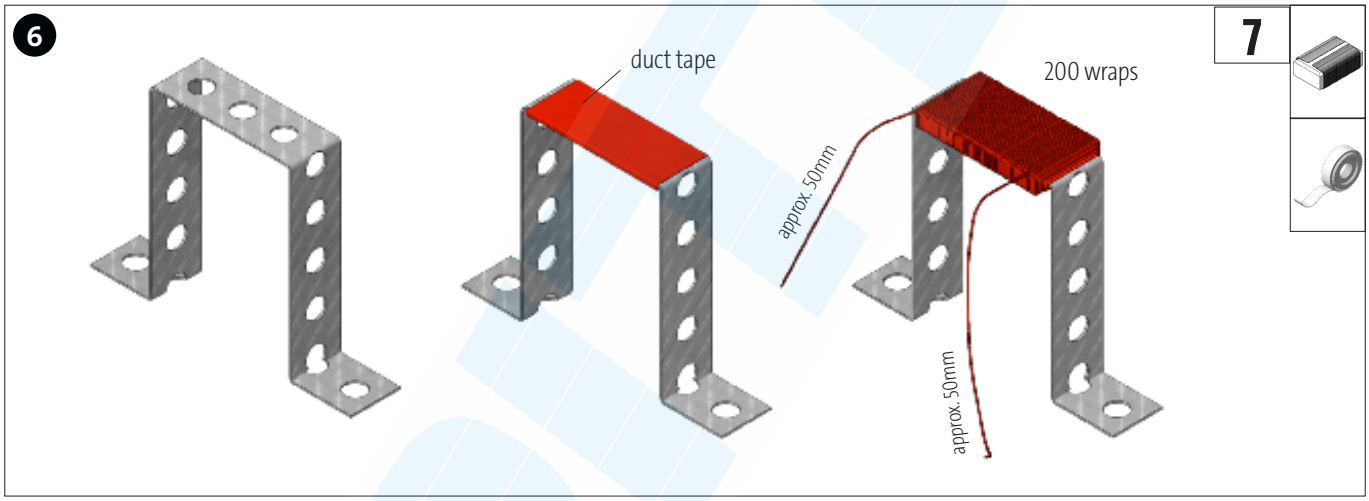
Cut 2 pieces with a length of 40mm from the perforated metal strip (3) and deburr them. Mark the bending edges on both sides.



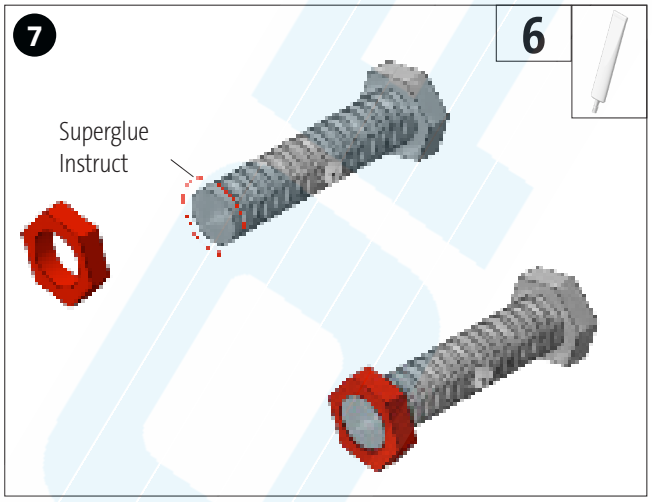
Then bend both perforated metal strips (3a) evenly at the bending edge 90°, as shown, using the combination pliers.



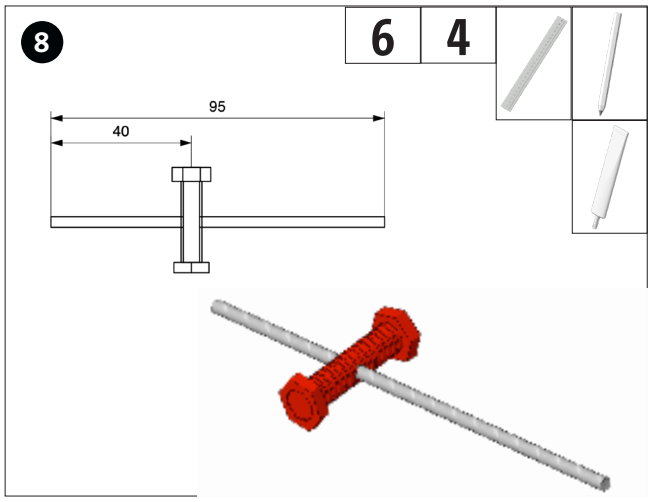
Mark the bending edges on the perforated strip as shown above. Cut off and deburr the section with the PUK saw. Then bend according to the specified number of holes.



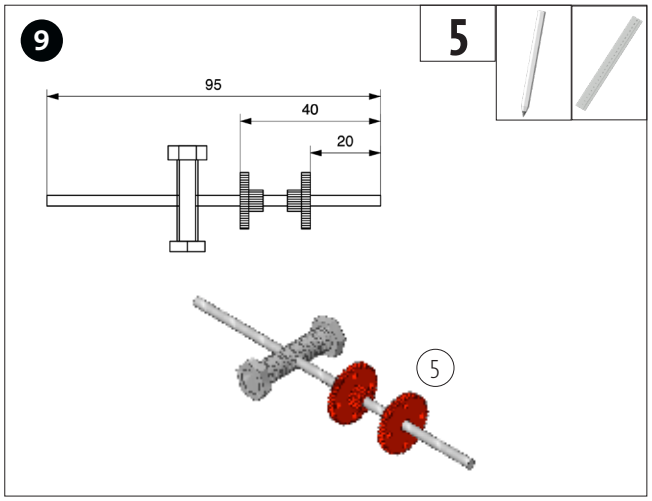
Insulate the top crossbar of the bracket with tape as shown. Make sure that all metal parts are well insulated. Then wind up 200 windings of the copper wire (7) in such a way that a connecting wire approx. 50mm long protrudes on both sides. Then strip the two connection wires about 10 mm with sandpaper.



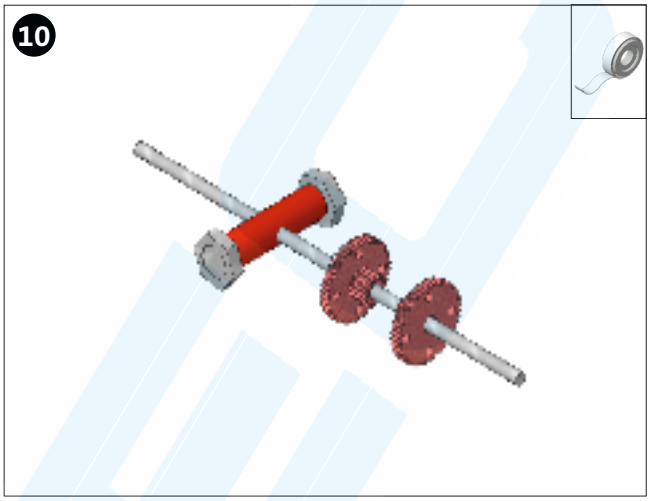
Unscrew the nut of the threaded screw (6) as shown and fix it with superglue.



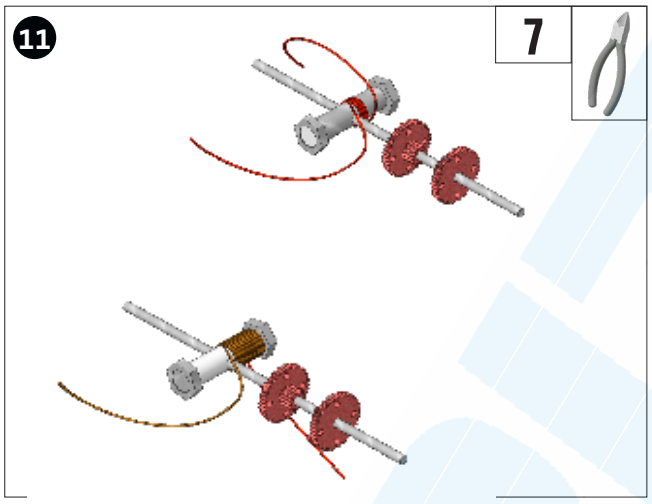
Measure and mark 40mm on the metal axle (4). Fix the threaded screw (6) in this position with superglue.



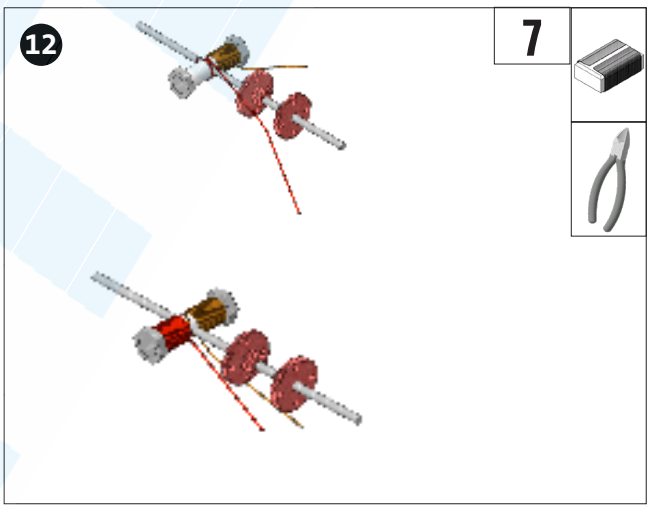
Transfer the dimensions to the axle (4) and position the two gears (3) on the markings.



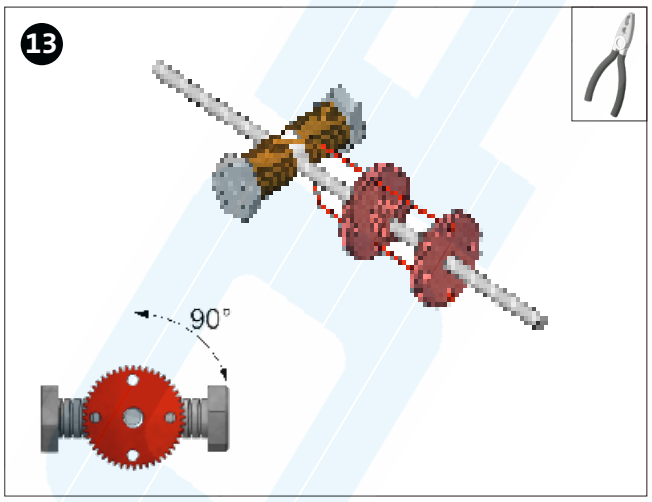
Mask the screw threads with adhesive tape or insulating tape.



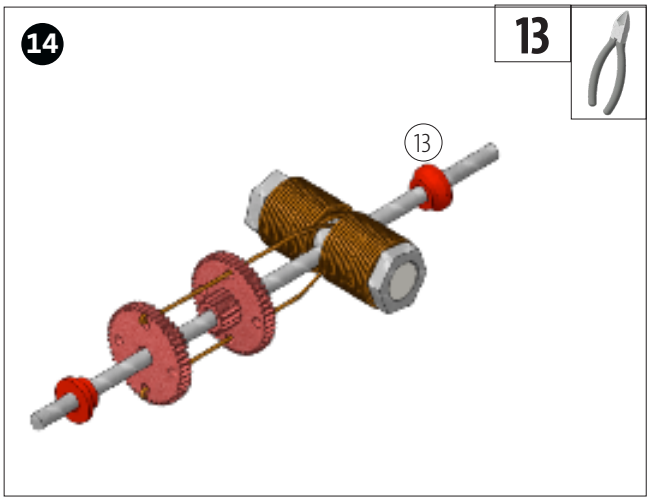
Lay the remaining enamelled copper wire (7) twice without bending it. Lead diagonally over the shaft and wrap it around 150 times on one side. Shorten the end of the wire to approx. 40 mm...



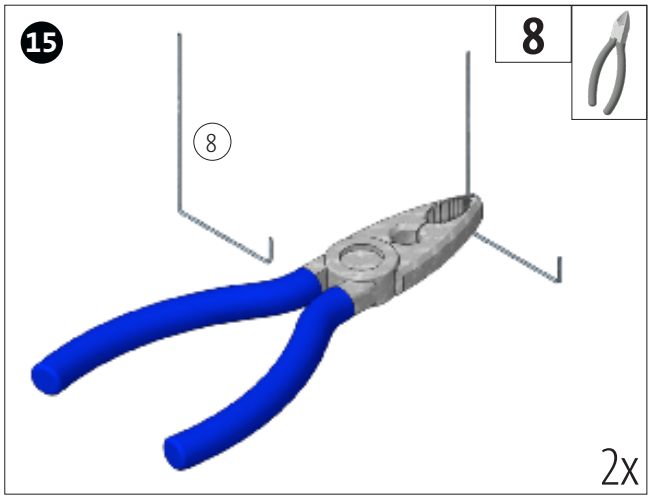
Now continue the winding with the second half of the wire on the other side 150 times in the same winding direction and shorten the end of the wire to approx. 40 mm. Strip both wire ends with sandpaper.



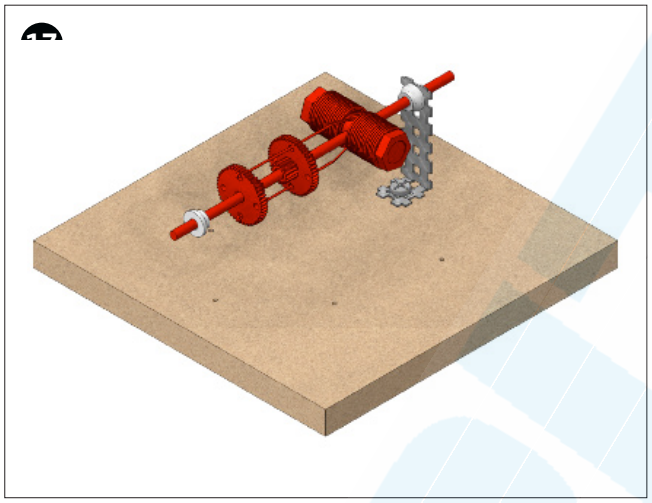
Feed the cable ends through the holes in the gears as shown and bend the ends to secure using combination pliers. Note the 90° alignment from the coil to the collector...



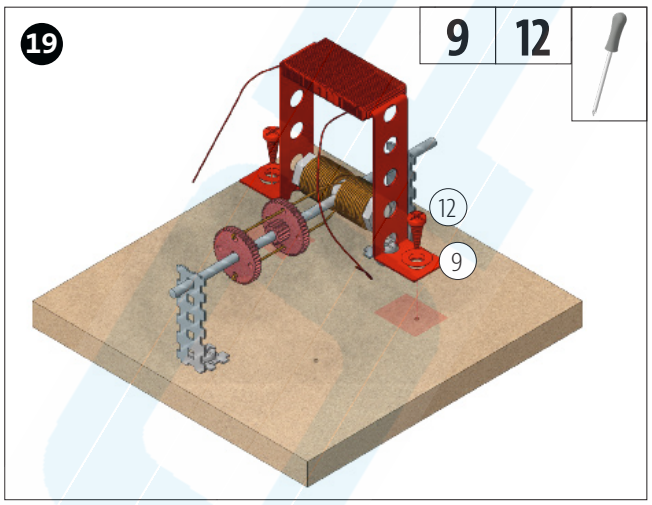
Attach the two spacers (13) as shown.



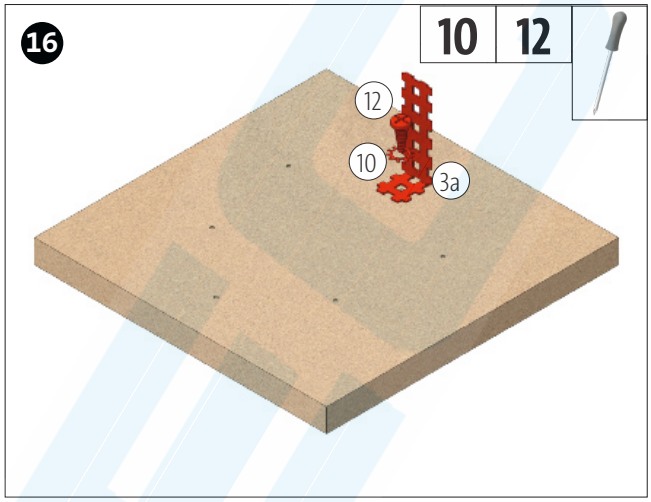
Cut 2 pieces (approx. 62mm) from the spring steel wire (8). Then bend the spring steel wire according to the bending template (B) with the combination pliers. Make both sliding contacts in this way.



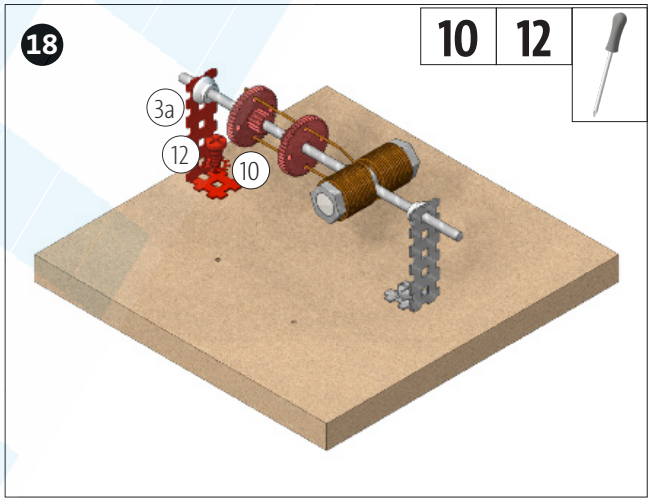
Insert the commutator in the bearing block (2b) as shown.



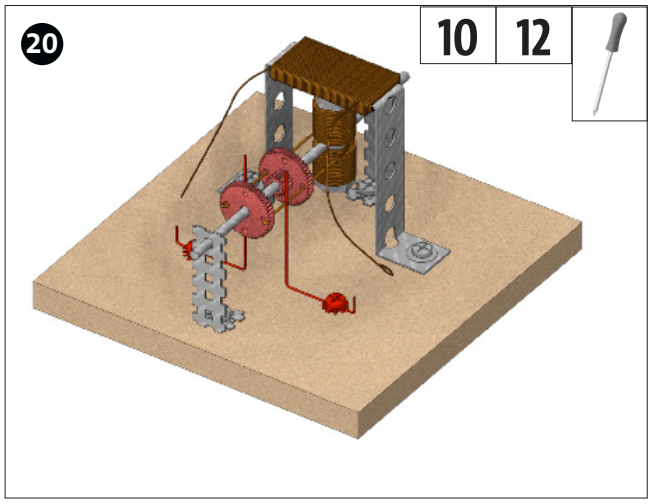
Screw the bracket with coil 2 onto the base plate using one screw (12) and one washer (9) as shown.



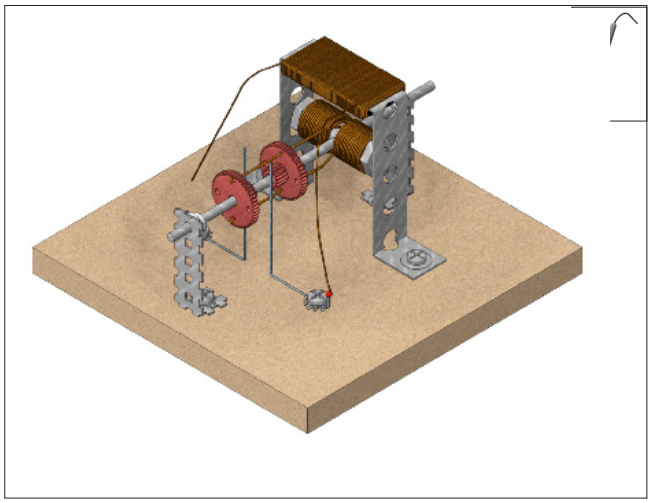
Screw bearing block 1 (3a, see step 4), as shown, onto the base plate using a screw (12) and a toothed lock washer (10).



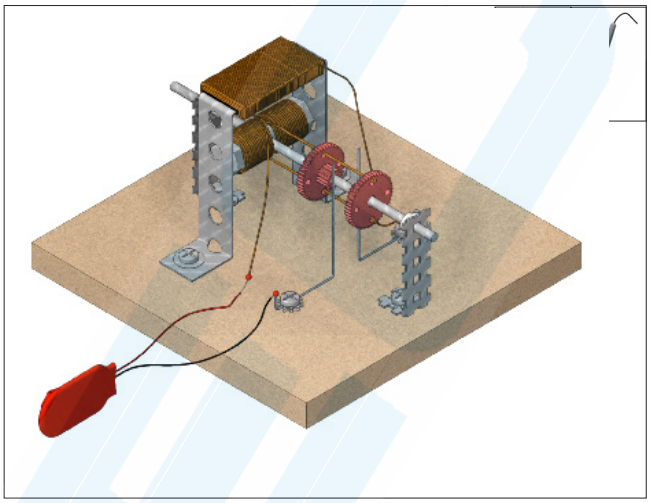
Screw bearing block 2 (3a, see step 4), as shown, onto the base plate using a screw (12) and a toothed lock washer (10).



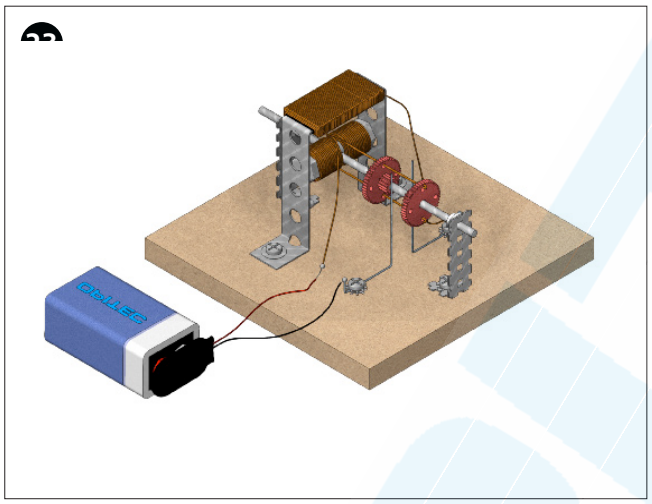
Fasten the spring steel brackets (8) with two toothed lock washers (10) and the screws (12) as shown in the figure so that the brackets only have light contact with the copper wire.



Solder the copper wire of coil 2 to the right sliding contact as shown.



Solder the red cable from the battery clip (11) to the free wire end of coil 2. Solder the black cable of the battery clip to the left sliding contact.



If the motor is to be operated with direct current, connect a 9V block battery or a power pack (DC). If the motor is to be operated with alternating current, connect a power pack (AC).

FINISHED!