

Mad on Mechanisms Instructions

1. Check your Kit

Each kit consists of:

- Instructions (you're reading them).
- Parts template sheet (Template for the finished parts for you to check against)
- Plastic pockets with sticky adhesive for names of team members to collect work. 5 names roles plus name of support teacher.
- Box of jumbo paper clips.
- Pliers x1.
- Bending Jig x1.
- Base with predrilled holes x1.

2. Straightening the paperclip

Use the pliers to gently straighten the paperclip, just like the video. Make sure you gently flatten each bend as shown below. Remove any kinks in the paperclip by gently compressing them in the jaws of the pliers.



The Axle Housing - Bending the paperclip to create the Axle Housing

You need to make 2 axle housings. This part is shown on the parts template as shown below.



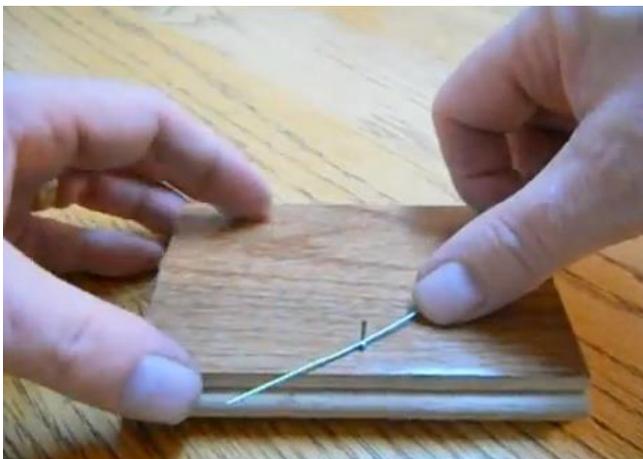
The finished part should match the picture on the part template sheet or the machine will not be able to be assembled. Take your time and be as accurate as possible.

Important

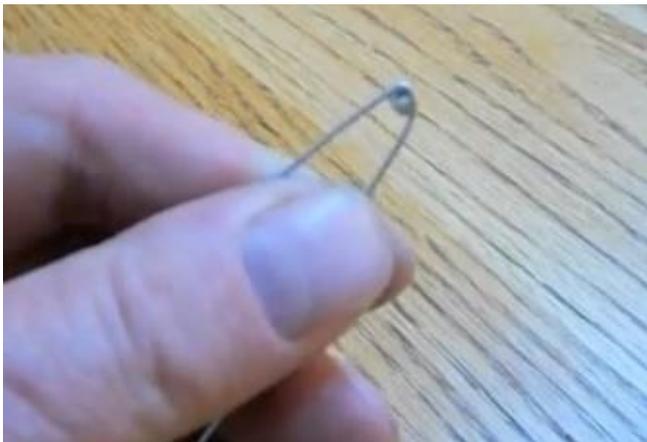
Take your straightened paperclip and measure it. Divide this number by half and mark it on the paperclip using the board marker. This mark is the middle of the paperclip. Now mark 10mm before the middle and 10mm after the middle. The mark before the middle will be the start of the bend and mark after will be the end.

Before bending the paperclip you need to ensure the straightened paperclip is correctly placed in the jig and aligned with your 10mm before the middle mark. This is not easy so a little planning and practice may be needed. Don't waste the paperclips because you may run out!

Like below:

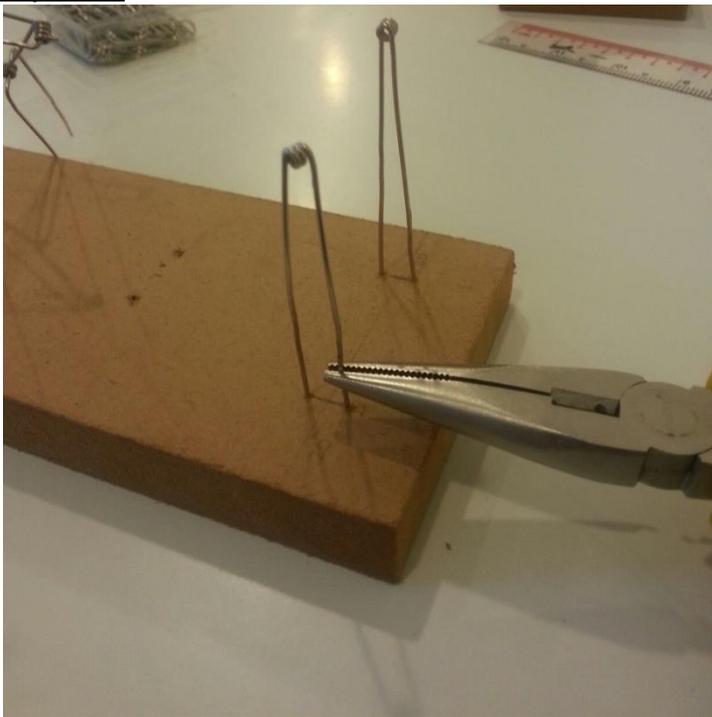


When creating the axle housing you hold the paperclip in place and turn the jig in a circular direction about 3 times.

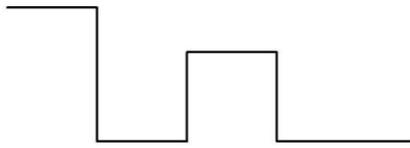


Check the axle housings up against the parts template. If the legs are too long then cut to the correct length. Fit the axle housing to the base in the axle housing holes but do not bang them in. you must gently push the axle housings into the base as shown below.

Important



The Crank



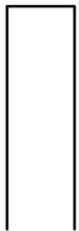
Crank

Important

Take your measurements from the Template sheet using a ruler. Mark the first measurement on the straightened paperclip with a marker pen. Make the bend by placing the straightened paperclip into the jaws of the pliers and forcing the metal into a 90 degree bend. Check the bend up against the template. Now complete the rest of the bends, checking each one against the template to ensure the crank is accurate.

Don't fit the Crank to the axle housing yet!

The Bridges 1&2

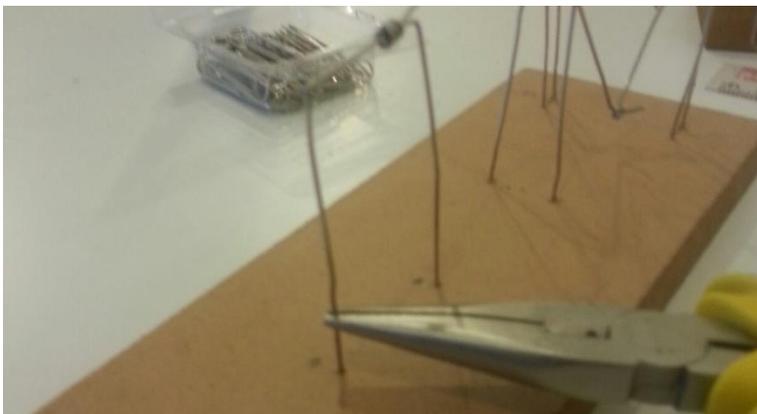


Bridge 1

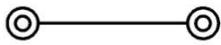


Bridge 2

Straighten the paperclips. Measure and mark the bends using a ruler and marker pen. After each bend check against the part template sheet. Fit bridge 1 and 2 to the base. Be careful not to bend the wire when pushing them into the predrilled holes. See below.



The Connecting Rod

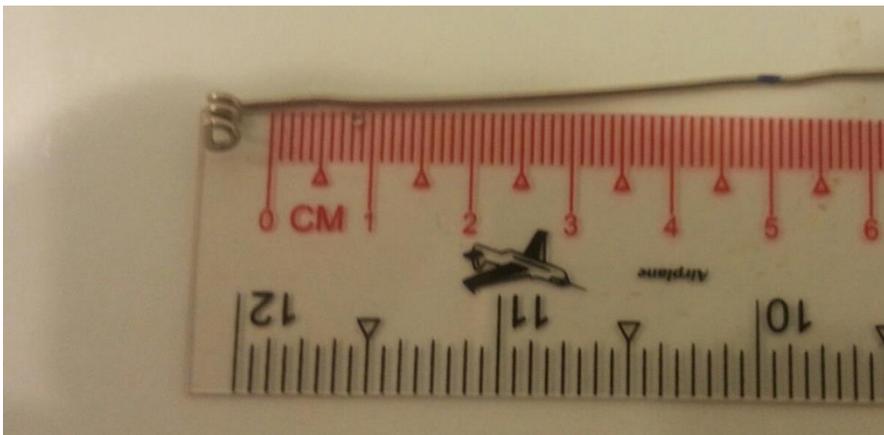


Connecting Rod

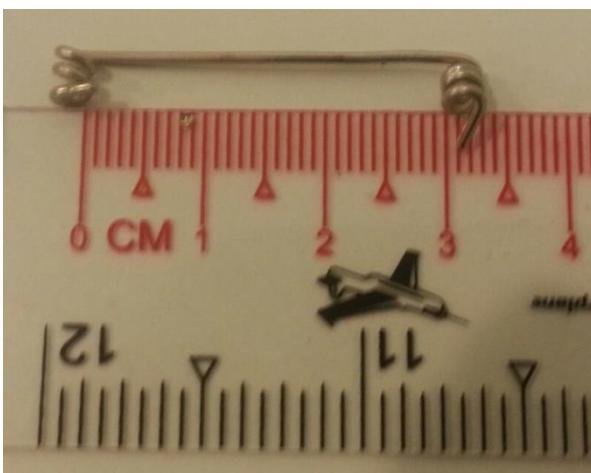
Straighten a paperclip. Bend one end using the bending jig 3 coils.



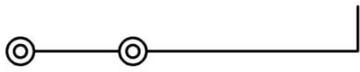
Now measure the paperclip, mark it and cut it to the length of 50mm as shown below.



Now bend the other end do you end up with a coil each end. The length should now be 30mm from coil to coil.



The Lever



Lever

Straighten a paperclip. Bend one end using the bending jig 3 coils.



Now measure the paperclip, mark it with a marker pen at a length of 50mm as shown below.



Now place the marked paperclip into the bending jig as shown below on the 50 mm mark.



Bend and create another coil (3 turns) on the 50mm mark.

The lever should look like this.



Its currently too long and should be 60mm in length from the coil to the end. Cut it to 60mm.

Put a small bend in the end of the rod like below, about 10mm long from the end. Check against the part template.

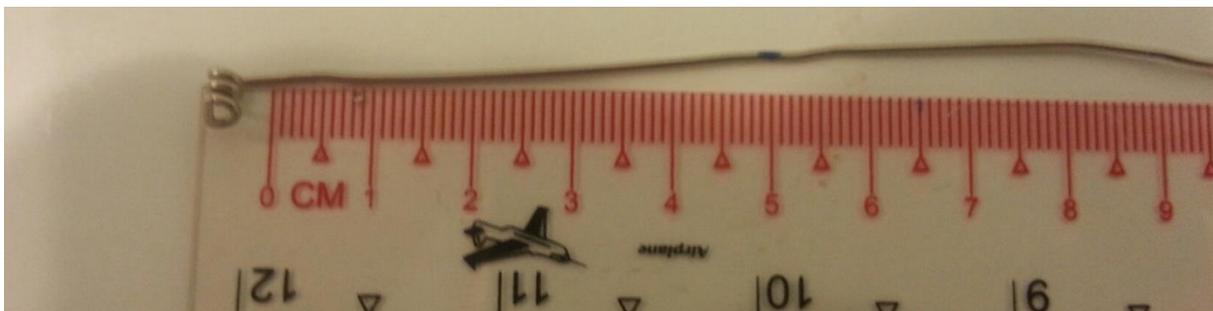
Piston



Straighten a paperclip. Bend one end using the bending jig 5 coils.



Mark out 50mm from the coil with a marker as shown below.



Apply 90 degree bend as shown below.



Mark out 10mm from the last bend with a marker and apply bend as shown below.



Using pliers, gently straighten the coil (piston) so it is pointing in the correct direction as shown below.



Well done, you have made all the parts.