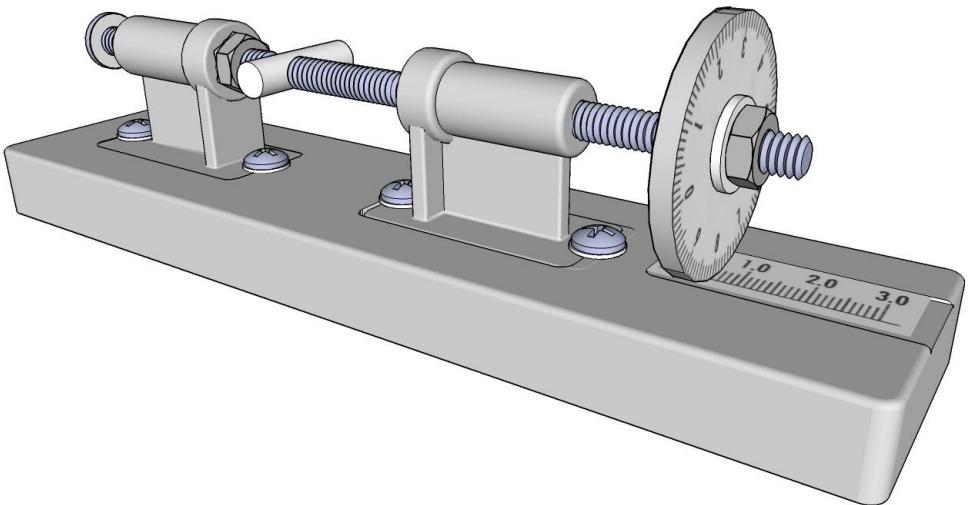


# MICROMETER Mk 4 INSTRUCTIONS

## The Finished Model



The model should look like this when it is finished. The important parts are shown in the picture.

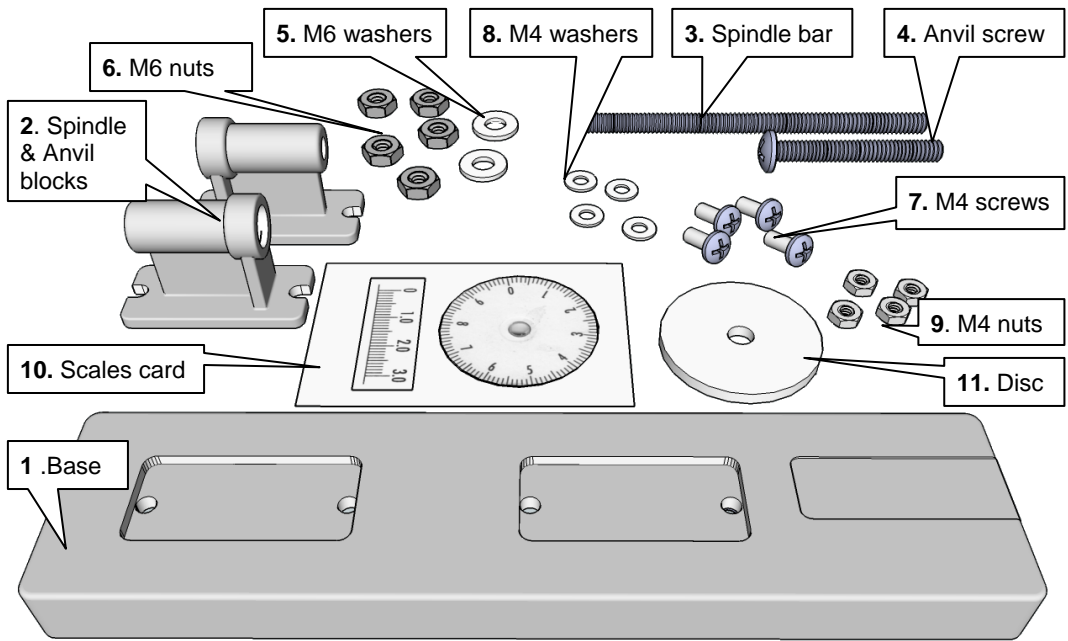
## Topics Covered

Screw threads, decimals, calibration and precision measurement..

## Tools required

Two 10mm open ended spanners. Pozidrive screwdriver, glue

**This is an Education Kit – not a Toy.**  
**It requires adult supervision during construction.**  
**The Kit contains small parts and is NOT suitable for children under 8yrs of age.**



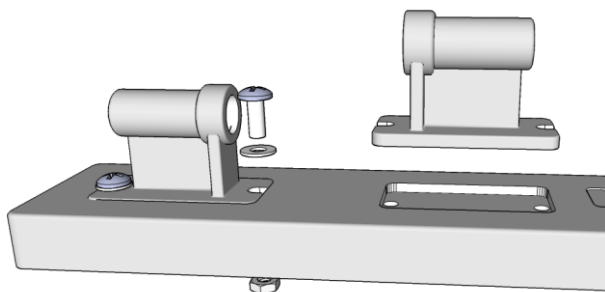
Item	Description	Number	Check
1	Base	1	
2	Blocks (Anvil & Spindle)	2	
3	M6 x 100 mm long Spindle bar	1	
4	M6 x 50mm long Anvil Screw	1	
5	M6 flat washer	2	
6	M6 nuts	5	
7	M4 x 10mm long screws	4	
8	M4 washers	4	
9	M4 nuts	4	
10	Circular & Linear Scales card	1	
11	Disc	1	

1. Check you have all the Parts and tick them off

## 2. Assembling the Base & Blocks

Take the Base (1) and place the two Blocks (2) into the top recesses so that the large ends face each other.

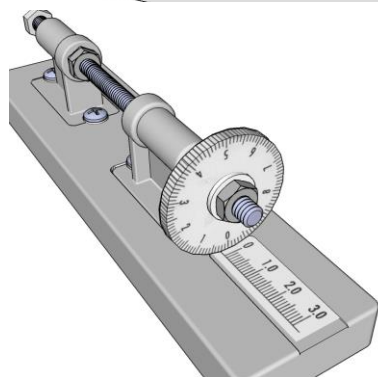
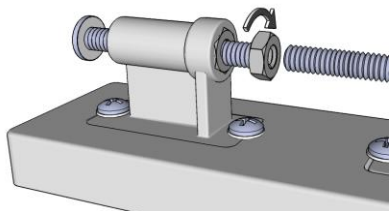
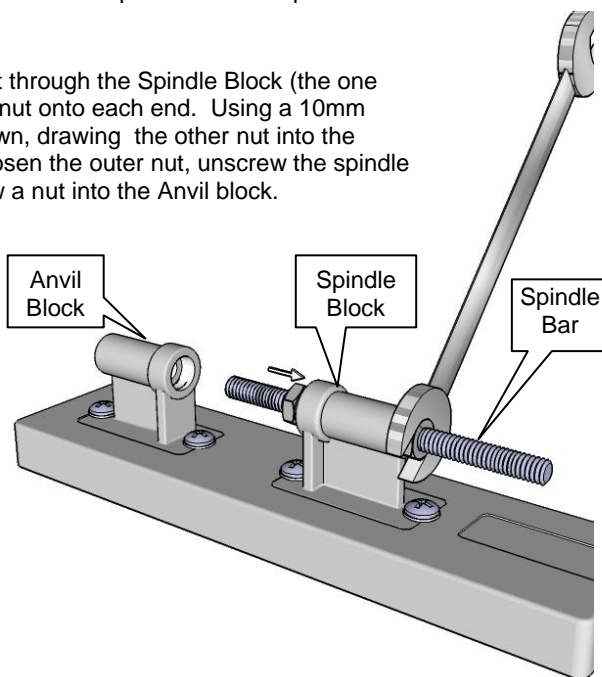
Take the M4 screws (7), put on M4 (8) washers and push them down through the Blocks and the holes in the Base. Spin on the M4 nuts (9) underneath and push them up into the hexagonal recesses. Tighten the screws on top with a screwdriver to secure the Anvil and Spindle Blocks in place.



## 3. Fitting the M6 nuts in the Blocks

Take the long Spindle bar (3), push it through the Spindle Block (the one farthest from end of base) and run a nut onto each end. Using a 10mm spanner tighten the outer nut as shown, drawing the other nut into the recess in the Spindle Block. Then loosen the outer nut, unscrew the spindle bar and repeat the procedure to draw a nut into the Anvil block.

Remove the Spindle bar from the Anvil block then screw the Anvil screw (4) through the nut by 9 – 10mm. Screw on a second nut (a lock nut) to contact the first nut (but not tight yet).



## 4. Attaching the Scales

Cut out the Circular scale and glue to the disc. Cut out the Linear scale and glue it in the recess on the base.

Rescrew the Spindle bar into the Spindle block and screw it until it just touches the Anvil screw end. Spin out the nut on the Spindle bar, put on a washer, then the Circular scale disc, another washer and the last nut.

Adjust the nuts to position the disc so that the Circular scale 0 is at the bottom just above the 0 line on the Linear scale. Tighten the nuts to secure the disc.

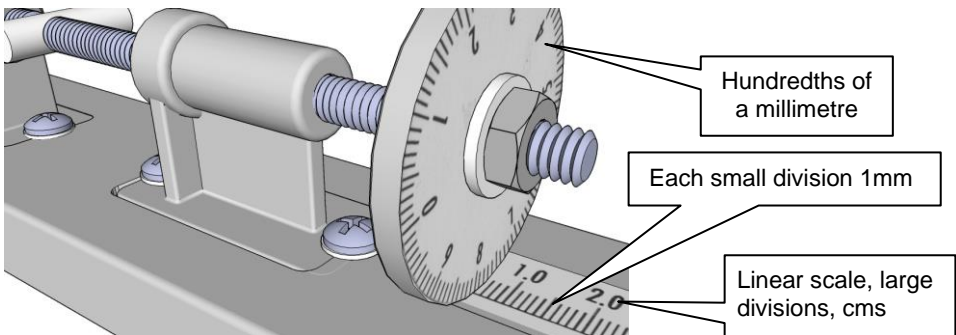
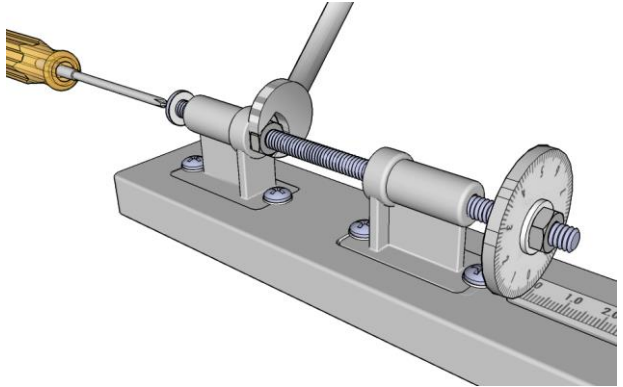
## 5. Calibration and Measuring

The aim is to position and lock the Anvil so that when the Spindle bar is screwed in to touch it, the Circular scale is '0 on 0'.

Use a Pozidriv screwdriver and 10 mm spanner on the Anvil screw and lock nut.

- Tighten the lock nut against the inserted nut
- Unscrew the Spindle bar a little; then screw it in to contact the Anvil
- If the Circular scale 0 goes past the bottom, the Anvil will need to be screwed in a little; if the 0 does not reach the bottom, the Anvil will need to be screwed out
- To do either, loosen the lock nut a little, adjust the Anvil screw in or out, tighten the lock nut again, and repeat step b)
- If still not '0 on 0', repeat c), d) and b) again.

To MEASURE a part, unscrew the Spindle to open a big enough gap. Then screw in the Spindle until the part is held gently between the Anvil and Spindle as illustrated by the example of a small bar shown in the first picture.



Each complete turn of the spindle bar moves it by a pitch of the screw, **1mm**, which is **1mm** on the linear scale. The circular scale is divided into 10 large divisions giving **0.1mm** and each of these sections is divided into 10 smaller sections, **0.01mm**.