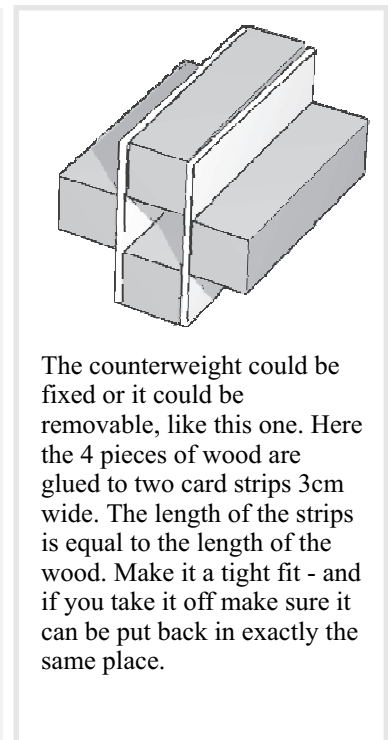
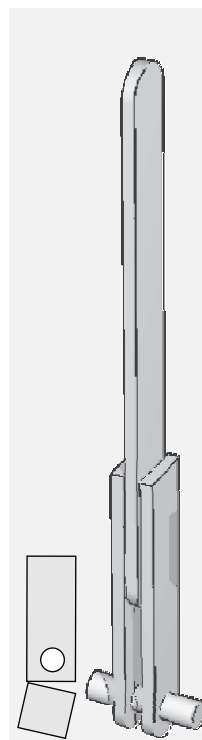
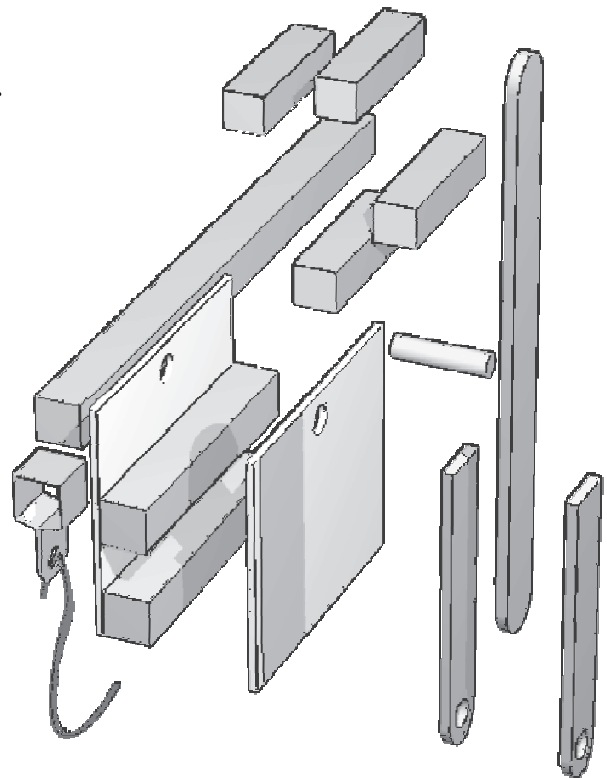
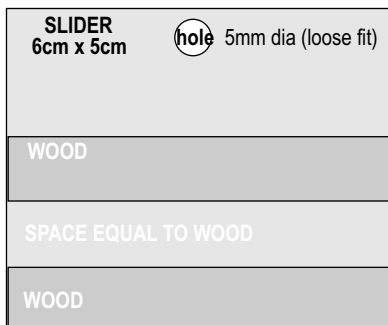


This is a simple weighing machine that relies on a lever. The machine has a fixed counterweight and the pivot, or fulcrum, is movable. it is based on the simple scales used in markets throughout the world.

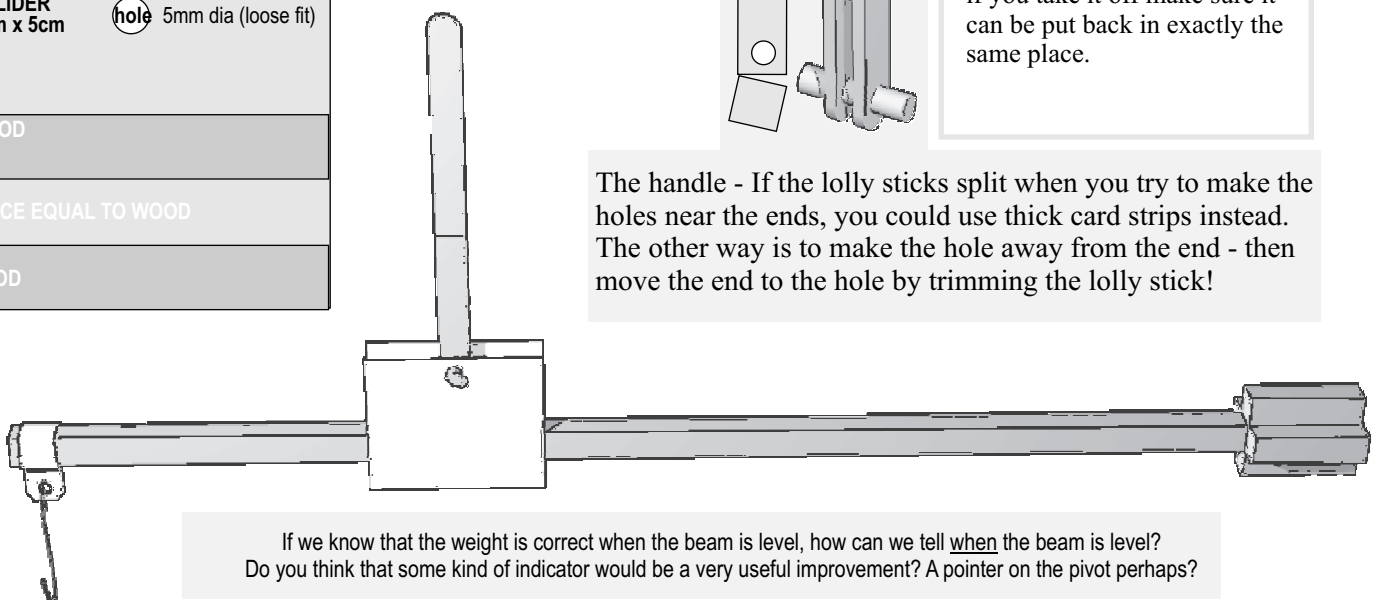
You will be aware that the exploded view gives no idea of dimensions, in fact, the main beam, the 'yard', is deliberately shown very short to save space. The arm should be at least 50cm long.

- Begin by making the slider. This is constructed using two card rectangles, 6 x 5cm and two wood spacers, 6cm long. The cards will need to be punched near top centre. Punch them together before gluing. The space between the two pieces of wood should be just enough to enable the main beam to slide without being loose. Glue the assembly together with the beam, or a substitute piece of wood, in place - remember to remove it before the glue dries.
- The handle is made from two lolly sticks one of which is cut in half. Each of these halves needs a hole punched very near the end. If this proves difficult you have two options - drill or punch away from the end then cut the wood so the end is near the hole - or use thick card strips instead.
- Once all the glue is dry assemble the handle, with its dowel pivot, the slider and the beam. No glue is needed for this step.
- The weight for the end isn't strictly necessary. You could have a longer beam instead. Indeed, if the four short pieces were still joined together and were a continuation of the arm your machine would be more efficient! (though more cumbersome). You can either glue 4 pieces of wood (4cm to 8cm long) to the beam or you can make up a detachable unit as shown. If you make such a unit make sure it is a tight fit.
- At the other end of the beam glue a bracket of tough card and punch a hole in it at the bottom. make a wire hook or attach a paperclip.
- To weigh an item you hang it on the hook and slide the beam through the slider until the beam balances horizontally. Unfortunately you have no little numbers to tell you how heavy the item is! That's the next job . . .
- CALIBRATION - hang known weights on the hook, balance the beam, and make marks on the beam against the side of the slider. Number the marks and then you will be able to tell the weight of other objects.



The counterweight could be fixed or it could be removable, like this one. Here the 4 pieces of wood are glued to two card strips 3cm wide. The length of the strips is equal to the length of the wood. Make it a tight fit - and if you take it off make sure it can be put back in exactly the same place.

The handle - If the lolly sticks split when you try to make the holes near the ends, you could use thick card strips instead. The other way is to make the hole away from the end - then move the end to the hole by trimming the lolly stick!



If we know that the weight is correct when the beam is level, how can we tell when the beam is level? Do you think that some kind of indicator would be a very useful improvement? A pointer on the pivot perhaps?