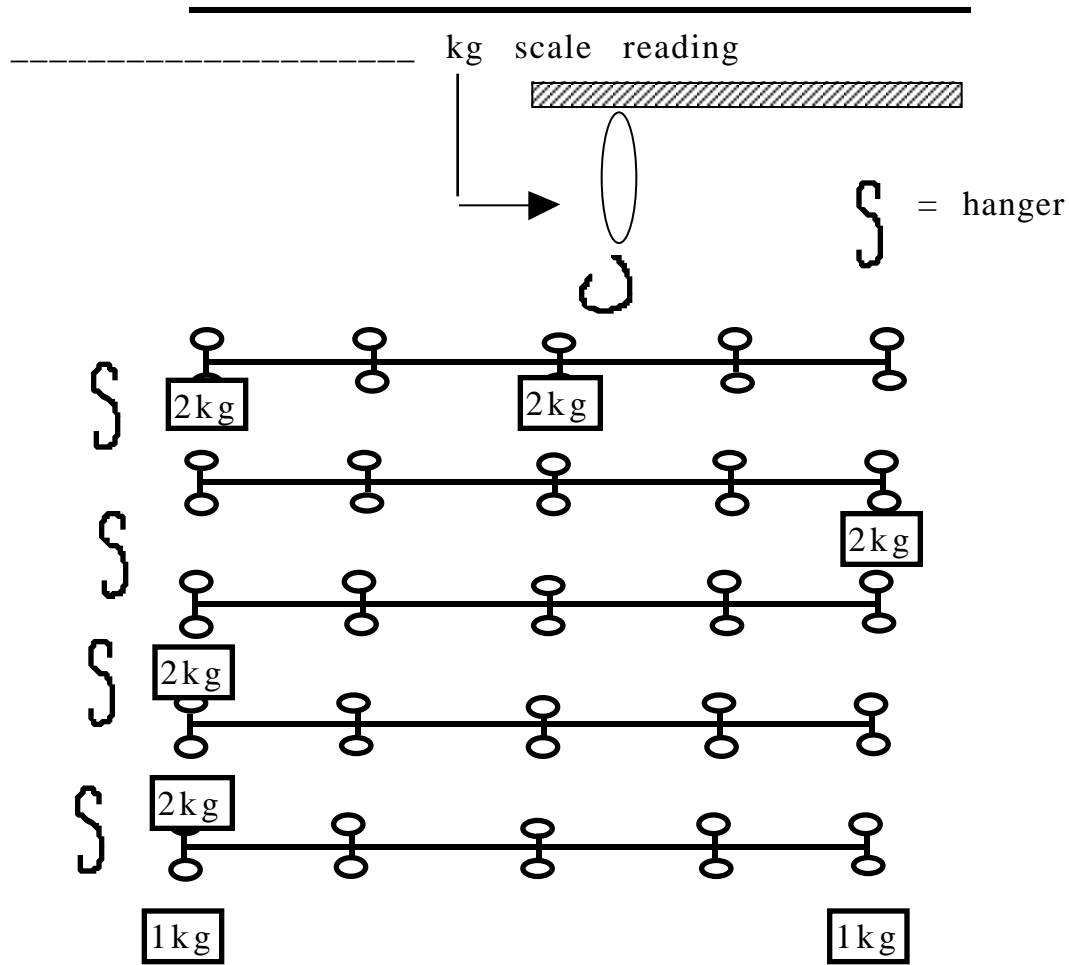
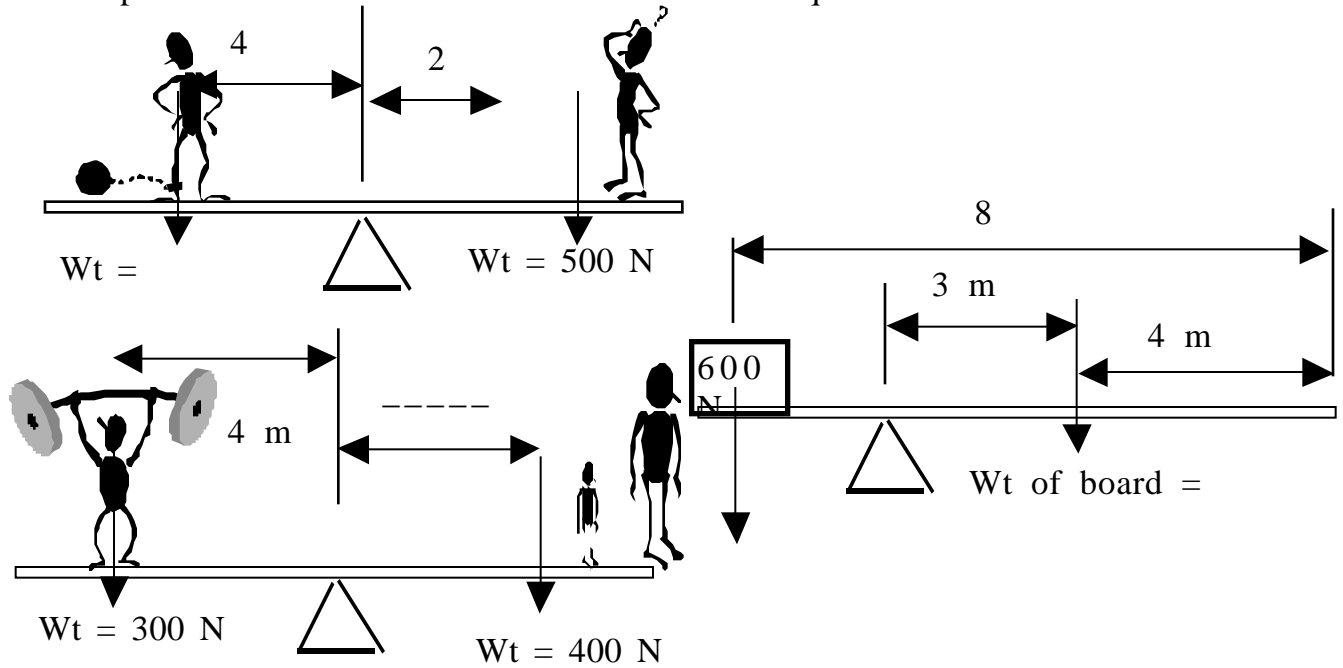


1. Apply what you know about torque and make a mobile. Shown are 5 horizontal arms with fixed 1 and 2 kg masses attached and 4 hangers with ends that fit in the loops of the arms, lettered A-R. You are to determine where the loops are to be attached so that when the whole system is suspended from the spring scale at the top, it will hang as a proper mobile, with each arm suspended horizontally. This is best done by working from the bottom up. Circle the loops where the hangers should be attached. At the bottom of the page, make a sketch of the completed mobile. When the mobile is complete, how many kilograms will be indicated on the scale ? (assume that the hooks and struts are practically massless compared to the 1 & 2 kg masses).

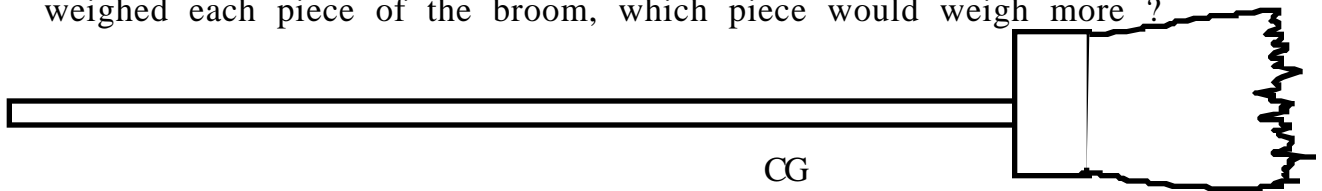




2. Complete the data for the 3 seesaws in the equilibrium.



3. The broom balances at its CG. If you cut the broom in two at the CG and weighed each piece of the broom, which piece would weigh more?



4. Sometimes high-jumpers will arch their body into an inverted U-shape as they pass over the bar. What justification is there for this in terms of your knowledge of the physics of the center of gravity?

-----

-----

-----

5. A sign is hung from a wall as shown. The sign is made from a uniform piece of wood which weighs 25 lb. The sign is 8 ft long, and the distance between the supporting bolts is A and B is 3 ft. Find the tension in the upper bolt. Show method clearly (use  $F_1d_1 = F_2d_2$ ).

