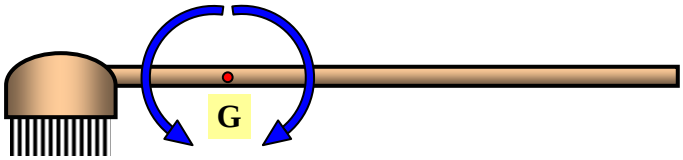
TAP 203- 1: Using the centre of gravity to find the mass of a broom

Apparatus required:

- ✓ Broom
- ✓ Large wooden spoon
- ✓ string

This simple experiment emphasises that it is not just the mass on either side of a balance point that determines whether an object will be balanced but also how it is distributed. First demonstrate this with a wooden spoon. Balance it on your finger to find the centre of mass and then cut it into two pieces through the centre of mass and weigh the two pieces showing that their masses are not equal. Then go on to the main experiment.



Hang up a broom from roughly the centre of its handle so that the head will go down - the centre of mass of the broom being on the side nearest the broom head. Now by loading the other end with masses bring the broom into a horizontal position. Locate the centre of gravity of the broom by removing the masses and adjusting the position of the string so that the broom balances.

Theory:

weight of masses × distance of weights from pivot = weight of broom × distance of centre of mass from pivot

Now ask the students to repeat the experiment with lab stands and masses. They can balance one stand on the other find the centre of gravity.

Apparatus required:

- ✓ Retort stand
- ✓ clamp
- ✓ String
- ✓ Slotted masses
- ✓ metre rules,
- ✓ slotted masses.