

A two-sided weight balance also known as a double-pan balance or beam balance is a type of weighing device that uses a horizontal beam supported at its center with a pan suspended from each end. The beam is level or balanced if and only if the weights on both pans are equal. This means, the only information you have is if the weights on both pans are equal or if one side is greater than the other.



Measure possible weights –

1. With two metal bars weighing 1kg and 9kg, what set of weights can be measured using only these bars and a double-pan balance?
2. With three metal bars weighing 1kg, 5kg and 10kg, what set of weights can be measured using a double-pan balance?
3. Divide a metal bar weighing 13kg into multiple pieces so that you can weigh all integer weights from 1kg to 13kg.
4. What is the minimum number of division that allows you to do this?
5. Similarly, what is the minimum number of divisions for a 40kg bar that allows you to measure all integer weights from 1kg to 40kg.

Bonus question –

- Find the minimum number of divisions for a n kg bar that allows you to measure all integers weights ranging from 1 to n .