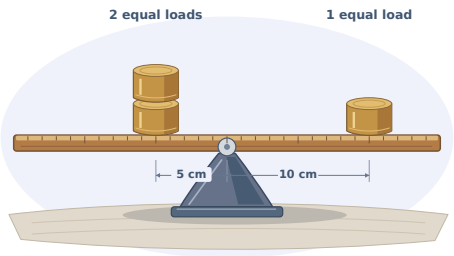
E CREATIVE ENGINEERING

HAMSTER LESSON #0000020

Balance the lever.

Distance changes the turning effect.



Balance depends on load × distance.

TRY IT TODAY

Move one equal load twice as far from the pivot.

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1. ❓ Can one weight balance two identical weights on the other side of a lever?
2. 🙋 Yes, if the single weight is twice as far from the pivot. Balance depends on both weight and distance from the pivot, not just the number of objects.
3. ⏳ The Science Museum Group holds an Egyptian equal-arm balance from about 1370–1350 BC. Its two pans compared an object with known weights, showing how useful a balanced beam has been for thousands of years.
4. 💡 Balance an empty ruler on a support. Put two identical coins 5 cm to one side of the pivot and one matching coin 10 cm to the other. Their turning effects should nearly balance.
5. 🔍 The same force has a greater turning effect farther from a pivot. A longer lever arm can reduce the force needed, but its end must travel farther: a lever does not create energy.
6. 🌎 From pliers to a wheelbarrow, engineers arrange pivots, loads, and handles to help people accomplish tasks. Understanding the arrangement helps us choose a suitable tool instead of simply pushing harder.
7. 🎯 Today, balance a ruler with two identical coins 5 cm from its pivot and one matching coin on the other side. Predict where the single coin should go, test your prediction, and measure the distance that brings the ruler close to level.

References · TeachEngineering: Levers That Lift · OpenStax Physics: Simple Machines · Science Museum Group: Ancient Egyptian equal-arm balance · Science Buddies: Lifting with a Lever
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