Pivot, load and effort: answers

Practised: naming the pivot, load and effort, and seeing a pivot can be anywhere along a lever.

Page 1 · Warm up

pivot → **the point a lever turns on**
load → **the thing being moved**
effort → **the push or pull you give**

Page 2 · Try it together

Ruler lever: pivot **the pencil**, load **the toy**, effort **your press on the other end**.

Others vary. **Tongs:** pivot the joined end, load the food at the tips, effort your squeeze in the middle. **Door handle:** pivot where it's fixed to the door, load the catch it moves, effort your hand on the end. **Stapler:** pivot the hinge at the back, load the staple, effort your press on top.

Page 2 · A. Label the levers

See-saw: box by the arrow **E**, over the crate **L**, by the triangle **P**.
Crowbar: over the rock **L**, by the arrow **E**, by the stone **P**.
Tongs: by the arrows **E**, by the joined end **P**, by the ball **L**.

Page 3 · B. True or false

1 **true** · 2 **false** (that's the effort) · 3 **false** · 4 **true** · 5 **false** (that's the load)

Page 3 · C. Draw a lever

Drawings vary. Check: a bar resting on a pivot, the box on the bar, and the effort somewhere else on the bar, all labelled.

Page 3 · D. Mia's idea

The place where a lever turns is the **pivot**. The **load** is the thing the lever moves.

Challenge: No, Ava isn't right. A lever's pivot can be anywhere along it. On a wheelbarrow the **wheel is the pivot**, at the front. The soil is the load and lifting the handles is the effort.

Watch out for

- **Swapping the pivot and the load.** Ask "Where does it turn?" first: that point is always the pivot. The load is the thing that gets moved.
- **Swapping the effort and the load.** The effort is what *you* do (your push or pull). The load is what the lever moves.
- **"The pivot must be in the middle."** See-saws and pegs have it in the middle, but wheelbarrows, tongs and staplers don't.

Going further (5 minutes, no paper)

- **Your arm is a lever:** lift a book on your hand. Where is the pivot? (Your elbow.) What is the load? (The book.)
- **Kitchen quiz:** take turns pointing at a tool and asking "Lever or not?" Then name its pivot.
- **In the game:** Chapter 2, Levers: how a lever lets a smaller force lift a heavy load, shows how moving your push or the pivot makes lifting easier.