Draw a Kids' Balance Scale in Four Simple Steps

Original tasks 1, 2, 3 / complete keys

Task 1

On paper 15 cm tall, mark a baseline 2 cm from the bottom and a midline 7 cm above the baseline. Draw a base 6 cm wide and 1 cm tall with its bottom edge on the baseline, a stand 1 cm wide and 7 cm tall centered on the base (bottom at the base top, top 1 cm above the midline), a beam 8 cm wide and 1 cm tall centered on the stand, and two pans hanging 1.5 cm below each beam end. All measurements in this exercise are hypothetical examples. Describe your drawing.

Answer: A simplified scale with a flat base on the baseline, a vertical stand reaching 1 cm above the midline, a level beam, and two equal pans hanging 1.5 cm below each end.

Reason: The baseline and midline set the x-height zone. The base top is 3 cm from the bottom (2 cm baseline plus 1 cm base height). The stand bottom sits at the base top and its 7 cm height reaches 10 cm from the bottom, which is 1 cm above the midline at 9 cm from the bottom (2 cm baseline plus 7 cm). Equal hanging lines keep the pans level.

Check: Use a ruler to confirm the beam is horizontal and both hanging lines are 1.5 cm.

Task 2

A student draws a beam 10 cm wide but places one pan 2 cm below the beam and the other 3 cm below. Is this a valid simplified balance scale? Explain and give a fix.

Answer: No, because the pans are at different heights. Fix by making both hanging lines 2 cm or both 3 cm.

Reason: A balanced scale shows equal pan heights. Unequal hanging lines make the scale look tilted.

Check: Measure both hanging lines with a ruler; they should match.

Task 3

Draw a simplified balance scale using rounded pans instead of rectangular ones. Keep the base 7 cm wide, stand 1 cm wide and 6 cm tall, beam 9 cm wide, and hanging lines 2 cm. Describe how your drawing still meets the convention.

Answer: The rounded pans are a valid alternative. The four parts are clear, the beam is level, and the pans hang equally.

Reason: The convention allows valid alternatives if the base, stand, beam, and two pans are identifiable and the beam is level.

Check: Confirm the beam is horizontal and both pans hang 2 cm below the beam ends.

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Original tasks 4 / complete keys

Task 4

On paper 18 cm tall, use a baseline 3 cm from the bottom and a midline 8 cm above the baseline. Draw a base 8 cm wide and 1 cm tall, a stand 1 cm wide and 8 cm tall centered on the base (bottom at the base top, top 1 cm above the midline), a beam 10 cm wide and 1 cm tall, and two pans hanging 2 cm. All measurements in this exercise are hypothetical examples. Then label all four parts. Describe your labels.

Answer: Labels read base, stand, beam, and pan. The drawing shows a level beam and equal pans.

Reason: Labels make the four parts clear. The base top is 4 cm from the bottom (3 cm baseline plus 1 cm base height). The stand bottom sits at the base top and its 8 cm height reaches 12 cm from the bottom, which is 1 cm above the midline at 11 cm. The x-height zone helps place the stand and beam consistently.

Check: Read each label aloud and check that the beam is horizontal with a ruler.

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Source rubric / reflection

- [ ] Base is present, flat, and wide enough to look stable.
- [ ] Stand is vertical, centered on the base, and supports the beam.
- [ ] Beam is horizontal and centered on the stand.
- [ ] Two pans hang from the beam ends at equal heights.
- [ ] Labels for base, stand, beam, and pans are readable.
- [ ] Valid alternatives (rounded pans, thicker stand) are accepted if the four parts are clear and the beam is level.

Reflection: What did you check, what did you change, and what will you try next?