Draw a Fairy House: Mushroom Roof, Tiny Door, Leaf Details

Original tasks 1, 2 / complete keys

Task 1

A student records 1x as 10 mm. They draw a body 40 mm wide and 50 mm tall, a cap 70 mm wide and 35 mm tall, a door 10 mm wide and 15 mm tall, and a window 10 mm by 10 mm. Check the proportions in x units and state whether the door is tiny enough.

Answer: Body width 4x, body height 5x, cap width 7x, cap height 3.5x, door width 1x, door height 1.5x, window 1x by 1x. The cap is wider than the body and overhangs by 1.5x on each side. Door height is 1.5x, which is 30% of body height (1.5 divided by 5), so it is tiny enough (one-third or less).

Reason: Divide each measurement by 10 mm to get x units. Compare cap width to body width and door height to body height. A door at 30% of body height meets the one-third target.

Check: Recompute 1.5 divided by 5 equals 0.30, which is less than 0.33. Confirm cap overhang: (7x minus 4x) divided by 2 equals 1.5x per side.

Task 2

A drawing has a body 3x wide and 4x tall, a cap 5x wide, a door 1x wide and 2x tall, and a window 1x by 1x placed 0.3x from the door. Identify two proportion or clearance problems and give a fix for each.

Answer: Problem 1: door height is 2x, which is 50% of body height (2 divided by 4), so the door is too large. Fix: reduce door height to 1.5x or less, or increase body height to 6x. Problem 2: window clearance from the door is 0.3x, below the 0.5x minimum. Fix: move the window at least 0.2x farther from the door so clearance is 0.5x or more.

Reason: Door height divided by body height gives 0.50, above the one-third target. Window clearance is compared directly to the 0.5x minimum.

Check: Compute 2 divided by 4 equals 0.50 and compare to 0.33. Subtract 0.3x from 0.5x to find the needed shift of 0.2x.

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Original tasks 3, 4 / complete keys

Task 3

A student wants a cap 6x wide and a body 3x wide. They plan a cap overhang of 1x on each side. Does the plan work? Show the arithmetic and state any adjustment.

Answer: A 6x cap over a 3x body leaves 3x total overhang, or 1.5x per side. The planned 1x per side is less than the available 1.5x, so the plan works and even leaves extra overhang. No adjustment is needed; the cap can be 6x wide with 1.5x overhang per side, which meets the at-least-1x requirement.

Reason: Subtract body width from cap width, then divide by two for per-side overhang. Compare the result to the 1x minimum.

Check: Compute (6x minus 3x) divided by 2 equals 1.5x. Confirm 1.5x is greater than or equal to 1x.

Task 4

A student records 1x as 6 mm and draws leaves 4 mm to 5 mm long. Are the leaves within the 0.5x–1x range? Show the arithmetic and suggest one valid alternative leaf count.

Answer: 0.5x is 3 mm and 1x is 6 mm. Leaves of 4 mm to 5 mm are between 3 mm and 6 mm, so they are within range. A valid alternative is a cluster of three leaves or five leaves instead of four, as long as each leaf stays 3 mm to 6 mm long and the door remains at least half visible.

Reason: Multiply 1x by 0.5 and by 1 to get the allowed range, then compare each leaf length. Leaf count is a stylistic choice within the decorative rule.

Check: Compute 6 mm times 0.5 equals 3 mm and 6 mm times 1 equals 6 mm. Check 4 mm and 5 mm both lie between 3 mm and 6 mm.

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Source rubric / reflection

- [ ] 1x is measured and recorded, and proportions are stated in x units or clearly derived from the recorded unit.
- [ ] Mushroom cap is wider than the body and overhangs by at least 1x on each side.
- [ ] Door height is about one-third of body height or less, and door width is about 1x.
- [ ] Window is about 1x by 1x with at least 0.5x clearance from door and cap underside.
- [ ] Leaves are 0.5x–1x long, decorative, and do not hide more than half the door.
- [ ] Valid alternatives such as round window, arched door, or different leaf counts are accepted if proportions and clearances hold.
- [ ] Final drawing has a ground line and readable outlines; planning marks are removed or kept on scrap paper.

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