Draw a Mountain with Trees: Scale and Placement Cues

Original tasks 1, 2, 3 / complete keys

Task 1

A mountain is 10 cm tall. You place two trees on the right slope with trunk bases at 3 cm and 6 cm above the baseline. Using hypothetical heights of 4 cm and 2 cm, check whether each tree's top stays below the peak.

Answer: For the tree with base at 3 cm and height 4 cm, the top is at 3 + 4 = 7 cm, below the 10 cm peak. For the tree with base at 6 cm and height 2 cm, the top is at 6 + 2 = 8 cm, below the peak. Both trees stay below the peak.

Reason: Add each trunk base height above the baseline to its tree height using the baseline-to-midline convention, then compare each sum to the mountain height.

Check: Re-add 3 + 4 = 7 and 6 + 2 = 8, then confirm both 7 and 8 are less than 10.

Task 2

A foreground tree is 9 cm tall and a midground tree is 3 cm tall. What is the ratio of foreground height to midground height? Express as a simplified ratio.

Answer: The ratio is 9 to 3, which simplifies to 3 to 1.

Reason: Divide both heights by the smaller height (3) to simplify the ratio.

Check: Multiply 3 by 3 to get 9, confirming the simplified ratio 3:1.

Task 3

You have a mountain 14 cm tall. You want to place four trees on the left slope with equal spacing of 2 cm between trunk bases, starting at 2 cm above the baseline. What are the four trunk base heights above the baseline?

Answer: The trunk base heights are 2 cm, 4 cm, 6 cm, and 8 cm above the baseline.

Reason: Start at 2 cm and add 2 cm for each subsequent tree: 2, 4, 6, 8.

Check: Count four values and confirm each differs from the next by 2 cm.

Draw a Mountain with Trees: Scale and Placement Cues

Original tasks 4 / complete keys

Task 4

A tree is drawn with its trunk base on the baseline. Its trunk midline is 7 cm above the baseline, but its foliage top reaches 11 cm. According to the convention, what is the tree height?

Answer: The tree height is 7 cm, measured from baseline to trunk midline.

Reason: The convention stops at the trunk midline, so the foliage top is not included.

Check: Confirm the measurement starts at the baseline and ends at the midline, not the foliage top.

Draw a Mountain with Trees: Scale and Placement Cues

Source rubric / reflection

- [ ] Baseline is drawn and tick marks are present.
- [ ] Height convention (baseline to trunk midline) is stated and followed for every tree.
- [ ] At least one foreground tree and one midground tree are placed with different heights.
- [ ] Tree trunk bases sit on the baseline or mountain slope, not floating.
- [ ] Heights and spacing vary between adjacent trees unless an intentional pattern is chosen and noted.
- [ ] Simple arithmetic check is shown or described for at least two trees, comparing each tree's top (base height plus tree height) to the mountain height.
- [ ] Alternative tree styles are accepted if the height convention is consistent.

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