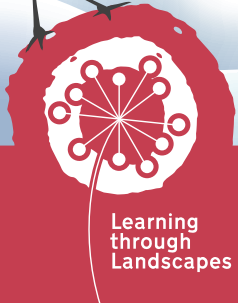




How to measure a Christmas tree

Subject: Mathematics



Previous Learning Required

- How to estimate heights and the concept of tallest and shortest.
- How to use a measuring tape or trundle wheel to measure distances in metres and cm.

Learning Outcomes

- To accurately use measuring devices to calculate distance.
- To use reasoning skills to check reliability of measurements.

Equipment

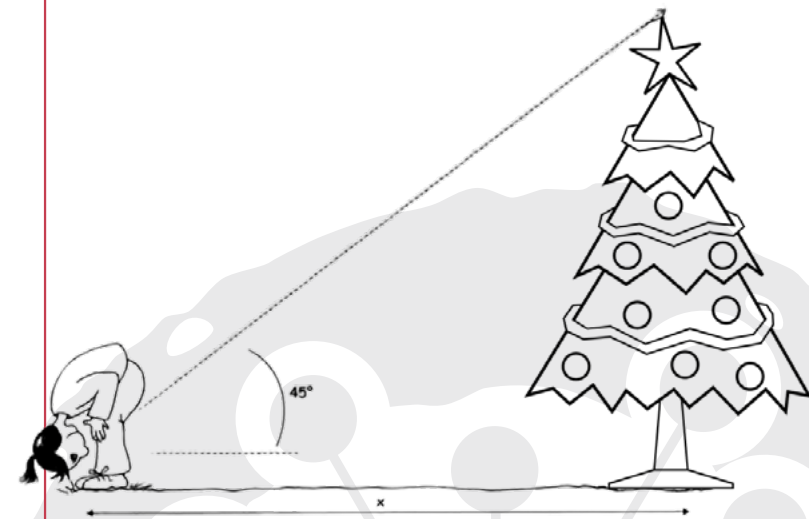
- Trees of various heights
- Long tape measures or trundle wheels

Activity

1. Ask pupils to pick a tree they want to measure and estimate its height.
2. Pupils should stand with their backs to the tree and start to walk away from it.
3. At regular intervals, they must lean forwards and look backwards through their legs.
4. Ask them to stop when they find the spot where they can just see the very top of the tree. If they can see any sky above the top of the tree, they have gone too far!
5. The distance from that point back to the trunk is the same as the tree's height.
6. This method works because you are creating a right-angled triangle which has two equal length sides - as long as you create a 45 degree angle.

Check for understanding

- Use a clinometer to make sure a 45 degree angle is being created from the pupil to the top of the tree.
- Compare the tree heights calculated to that of a known object and use reasoning to test it. Does the height make sense? If the pupils are approximately 1.5m tall, is the tree twice as tall? Or 5 times as tall?
- Practise the technique by testing it on something we know the height of already e.g. a football goal, or a school building. Pupils can refine the method with known heights.



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