

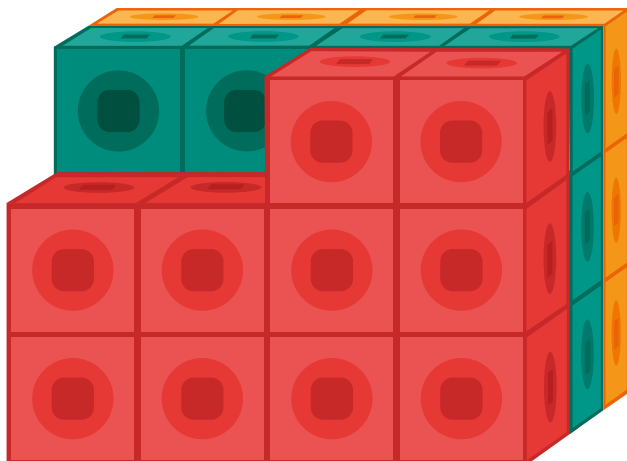
What is your teaching focus? What skills or knowledge do you want pupils to develop?

In this lesson, I used worked examples to develop pupils' thinking around generalising either using words or algebra. I also wanted pupils to have an increased awareness of the variety of possible approaches to a single problem. I hoped that this would help them understand that there are multiple possible ways to be successful, whilst also encouraging them to critique different strategies.



Worked Example 1:

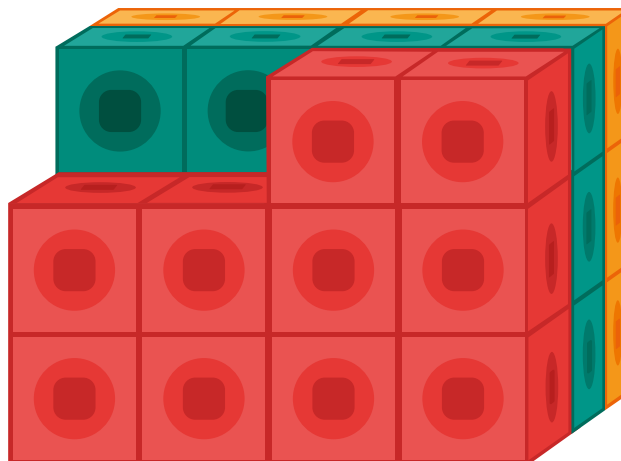
How many cubes are here?



"I counted the cubes one by one."

Worked Example 2:

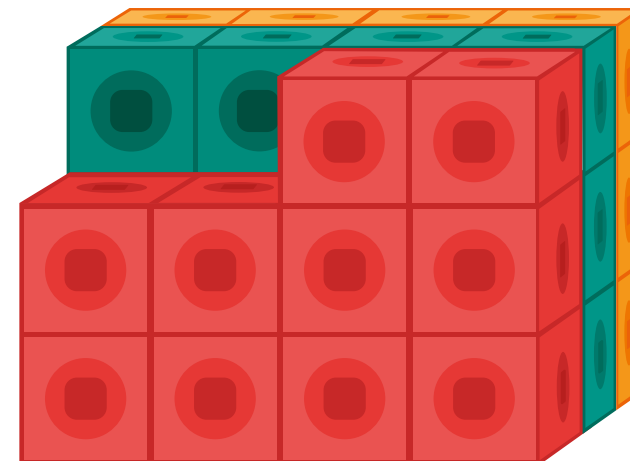
How many cubes are here?



"I counted the cubes in the bottom layer and then multiplied by the number of layers. At the end, I took away 2 because there are 2 cubes missing in the top layer."

Worked Example 3:

How many cubes are here?



"I measured the height, base and length and then multiplied them together. I took away 2 from my answer for the 2 missing cubes from the top layer."

School Context:

This worked example was developed by Mari Palmer, Headteacher at Settrington All Saints' Church of England Primary School. This smaller than average school in North Yorkshire has 81 pupils in total. The proportion of disadvantaged pupils is in-line with national averages.

How did you use this?

I was expecting the pupils (especially Year 6) to remember that they had used or seen the strategies featured in the worked examples before. Before introducing the worked examples, we spent time recalling/learning the terms area, volume and capacity. Pupils then spent time thinking independently about which strategy they preferred and then comparing which strategy they would choose from the three presented and explaining their reasoning. Key questions included:

- *What is the same and what is different here?*
- *What might be challenging?*
- *When else might you use...?*

After using these worked examples, we went into a lesson using the formula 'width x height x length' for cuboids. I feel that using the worked examples beforehand had given the pupils a greater understanding of why and when to use the formula rather than just learning to multiply the three dimensions.

What were outcomes for pupils?

I felt this approach provided useful scaffolding for some pupils as it allowed them to develop their understanding through the whole-class discussion. Some pupils demonstrated a superficial understanding of volume. For example, one pupil had remembered that 'width x height x length' could be used to calculate volume but thought this could be applied to any shape.

During the discussion we were able to explore this and overcome the misconception. The pupils really enjoyed this discussion, particularly that they could have different approaches that could all have value. I feel it was a successful introduction to volume and capacity and it helped to inform my decision making about when to move on. Originally I had planned to move straight to formulae, but it was clear that first the children needed to understand when and why they would choose to use them.

Advice for practitioners:

- *Leave time for talk, both between pupils and as a class, to allow pupils to explain their ideas. This helps them to articulate their thoughts clearly, but also helps us as teachers as we can better-understand pupils' current thinking.*
- *When selecting worked examples, focus on presenting approaches which all model useful elements, but still explain that some may be better than others (e.g. because some are quicker and more efficient than others, or may fit with pupils' understandings of their own strengths and areas for development as learners).*
- *During discussions, take time to clarify the language and vocabulary that pupils are using. This helps them to develop their ability to communicate their ideas clearly. It can be useful to provide key vocabulary prompts as well as stem sentences.*



Additional Resources:



Guidance Report: Improving mathematics in key stages 2 and 3
eef.li/maths-ks2-ks3



Guidance Report: Metacognition and self-regulated learning
eef.li/metacognition