WORKED EXAMPLES IN KS2 MATHEMATICS

Caroline Sharp, Redriff Primary School

Education Endowment Foundation

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

These worked examples were used to help pupils consider different approaches to working systematically. For this problem, two different ways to organise information and support systematic working were selected: a table and a cartesian model. These models were then used to encourage discussion around organising recording to support systematic working and to prompt pupils to reflect on the benefits and other ways they could do this.

Worked Example 1:

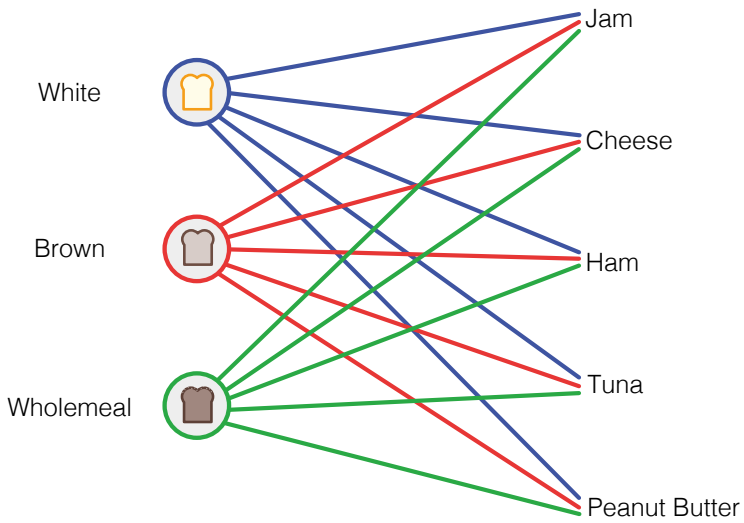
Dad is making sandwiches for a party. There are 3 different types of bread—white, brown and wholemeal—and 5 different fillings—jam, cheese, ham, tuna and peanut butter. Each sandwich has only one type of bread and one filling. How many different sandwiches can he make?

White	Brown	Wholemeal
Jam	Jam	Jam
Cheese	Cheese	Cheese
Ham	Ham	Ham
Tuna	Tuna	Tuna
Peanut Butter	Peanut Butter	Peanut Butter
= **5**	= **5**	= **5**

= 15 sandwiches in total

Worked Example 2:

Dad is making sandwiches for a party. There are 3 different types of bread—white, brown and wholemeal—and 5 different fillings—jam, cheese, ham, tuna and peanut butter. Each sandwich has only one type of bread and one filling. How many different sandwiches can he make?



= 15 sandwhiches in total

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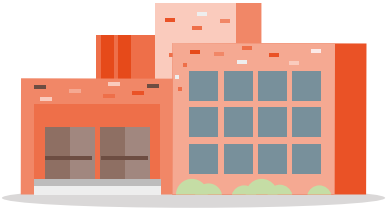
School Context:

These worked examples were developed by Caroline Sharp, Assistant Headteacher at Redriff Primary School, which is part of the City of London Academy. Redriff Primary is a larger than average primary school in southeast London. The proportion of pupils eligible for pupil premium is also above average.



How did you use this?

Before sharing the worked examples, pupils were given the problem and asked to begin exploring ways in which they could represent it visually to help activate their prior knowledge. This was to prompt pupils' thinking and provide an opportunity for initial assessment.

The complete worked examples were then shared with pupils. Pupils were prompted to reflect on the use of the table and cartesian model to organise recording.

Key questions included:

- *How do these examples help you understand the problem?*
- *How can you use these to solve the problem?*
- *Why is organised recording a useful strategy?*

Pupils were then asked to consider the potential benefits and challenges of both approaches, and to say which they preferred and why. This supported pupils to reflect upon the potential uses of these approaches in their own independent work. Pupils were prompted to consider other strategies to organise recording for this same problem, working collaboratively to find possible alternatives.

What were outcomes for pupils?

In their own independent work after exploring these worked examples, pupils drew upon the models here, particularly the cartesian model, and could explain why they had chosen to organise their work in this way, focusing on avoiding missing out or repeating any potential combinations.

In our discussions, pupils also moved beyond the models provided in the worked examples to identify more ways to organise their recording, including the use of letters and symbols to make their working quicker and more efficient. We shared some of these with the class to continue to develop pupils' understanding of the multiple different ways to approach problem-solving.

Advice for practitioners:

- *Consider providing worked examples of useful approaches that pupils would not necessarily come up with for themselves. This can help widen the bank of approaches that pupils are familiar with, so that they can use these in their own future independent work.*
- *Use 'debrief' questions to help pupils unpick why particular strategies have been used. This is important both for the worked examples provided by the teacher, and for any different approaches the pupils develop, to prompt them to consider any benefits and potential challenges. Key questions include 'What worked well? Why?' and 'When else might you use this approach?' These questions help pupils make connections which will support their future independent work.*

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