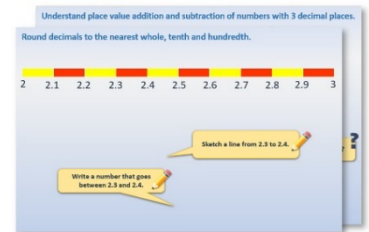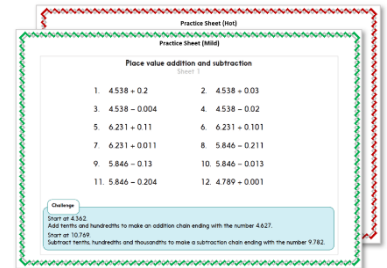# Week 15, Day 1
Logic puzzles

Each day covers one maths topic. It should take you about 1 hour or just a little more.

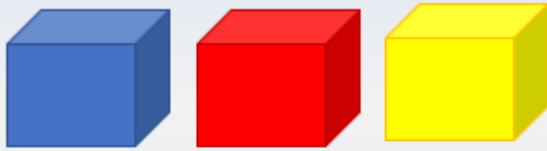1. Start by reading through the **Learning Reminders**.

2. Tackle the questions on the **Practice Sheet**.
    There might be a choice of either Mild (easier) or
    Hot (harder)!
    Check the answers.

3. Think you've got it? Have a go at the **Investigation**.

Learning Reminders

Solve logic puzzles.

Inside each box is a cube and a counter, which are a different colour to each other and to the box. There is one blue cube, one blue counter, one red cube, one red counter, one yellow cube and one yellow counter.

The red cube and the yellow counter are not in the blue box.

Believe it or not, this one clue is enough to solve the whole puzzle! Think about how we could solve this.
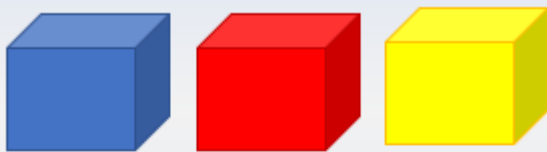
It can be useful to put information we have in a table so that we can see it more clearly.

What information can we put in the table straight away?

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box						
Red box						
Yellow box						

Solve logic puzzles.

The red cube and the yellow counter are not in the blue box.

We know that the blue cube and blue counter are not in the blue box, so we can put crosses there, and likewise for the other two colours.

We know from the clue that the red cube and the yellow counter are not in the blue box so we can put crosses there too.

So looking at the table what do we know now?

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	X			X
Red box			X	X		
Yellow box					X	X

Learning Reminders

Solve logic puzzles.

The red cube and the yellow counter are not in the blue box.

We know what's in the blue box!

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	X	V	V	X
Red box			X	X		V
Yellow box					X	X

And we know where the yellow counter is too.

What else do we know now?

Solve logic puzzles.

The red cube and the yellow counter are not in the blue box.

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	X	V	V	X
Red box			X	X		V
Yellow box		V	V		X	X

The red cube must be in the yellow box.

Therefore the counter in the yellow box must be blue.

So where must the blue cube be?

Learning Reminders

Solve logic puzzles.

The red cube and the yellow counter are not in the blue box.

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	X	√	√	X
Red box	√		X	X		√
Yellow box		√	√		X	X

Let's just check...
Does each box have a different colour cube and counter and are they a different colour to the box?

And does our solution satisfy the clue?

Yes!
But good to check.

Solve logic puzzles.

The red cube and the yellow counter are not in the blue box.

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	X	√	√	X
Red box	√		X	X		√
Yellow box		√	√		X	X

Once we put in the information we had to the table, it was far more straightforward to visualise what went where!

Practice Sheet All Children
Logic puzzles

There are three boxes, one blue, one red and one yellow.
Inside each box is one cube and one counter, which are a different colour to each other and to the box.

There is one blue cube, one blue counter, one red cube, one red counter, one yellow cube and one yellow counter.

With a partner, use logic to work out which boxes each of the counters and cubes must be in, given just this one clue:

1. The yellow counter is in the blue box.

Now have a go at this Challenge!

Practice Sheet Hot

Make up a different arrangement of cubes, counters and boxes.
Write just one clue and ask another pair to use it to solve the puzzle.

Practice Sheet All Children
Logic puzzles

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box						
Red box						
Yellow box						

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box						
Red box						
Yellow box						

	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box						
Red box						
Yellow box						

Practice Sheet Answers

Practice Sheet (All Children)

|	Blue cube	Blue counter	Red cube	Red counter	Yellow cube	Yellow counter
Blue box	X	X	✓	X	X	✓
Red box	X	✓	X	X	✓	X
Yellow box	✓	X	X	✓	X	X

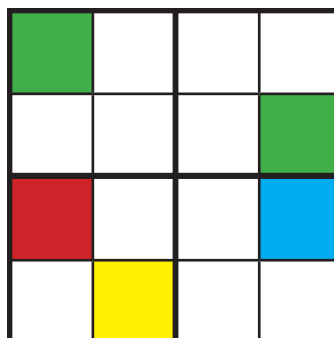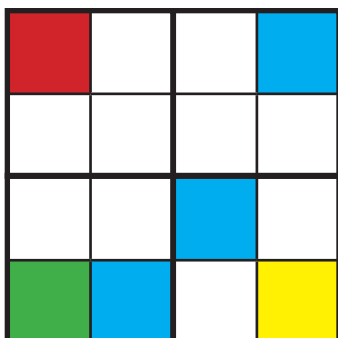# Investigation
Colour conundrum

You will need:

- Red, blue, green and yellow colouring pencils.

What to do

- Blue, red, green and yellow squares are arranged in the grid below so that each 2 by 2 box, each row, column **and** corner-to-corner diagonal contains just one square of each colour:
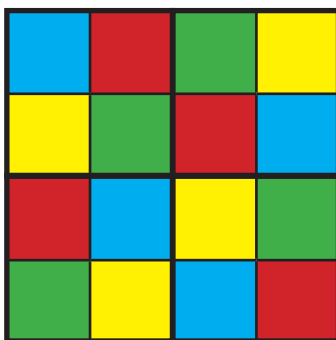
- These grids have just been started. Can you complete them?

- Use these empty grids to design similar challenges for someone else to solve (check that they 'work' before passing them across).