



# First Mathematics Challenge 2019

## INSTRUCTIONS please read carefully

Your pack should contain:

- FMC question papers
- Answers and Notes – (also on reverse of this sheet)

Please note that the MA holds the copyright to the question papers. PAPERS MAY NOT BE PHOTOCOPIED.

Pupils taking the Challenge must be in Year 4 or below, or pupils must be 9 years old at the end of the school year or younger.

The Challenge can be taken any time during the week beginning **17th June, W/b 24th June, W/b 1st July.**

Schools taking part in London Maths Week may take the Challenge at a time that suits them during the **w/b 10th June.**

**Please DO NOT publish the paper on any social media platforms until after the 5<sup>th</sup> July when everyone has had a chance to complete the Challenge.**

### Taking the Challenge:

- FMC papers may be enlarged and translators may be used;
- Adults may read out questions to pupils but should not interpret or rephrase the questions in any way.
- 45 minutes is allowed for the paper itself; extra time will be needed for the two practice questions. Use this time to help pupils understand what they should do and where they should write the answers.
- Rough paper must be provided. Rulers, calculators and all other aids are not permitted.
- After the practice questions are done, no talking is allowed. Pupils work on their own.
- Pupils choose only one option of A B C D or E for each of their answers to questions 1 – 20 in the box provided.

After the FMC, the teacher in charge should:

Mark the papers. Correct answers to all questions get one mark each. For answers see reverse of this sheet.

### Returning you results and feedback:

You will receive an email which will contain a link to a secure Google Form. We do not ask for any names, all we ask for is the number of children scoring each mark from 1 – 20.

e.g.

No. of Marks Scored	No. of Children earning the mark
1 Mark	0
2 Marks	5
3 Marks	4
4 Marks	0
5 Marks	2

The form will also include the feedback submission. Please take time to fill this in, the more feedback the better we can make FMC for you and your pupils!

### Certificates

We will send the certificates to you once you have submitted your scores, along with a copy of your results submission and a letter giving the mark boundaries for each award. The minimum award any pupil will receive is a bronze certificate.

**Please note: all FMC packaging is made from recycled plastic and is also fully recyclable.**



## Answers and Notes

Question	Answer	Explanation
P1	E	7 more circles than dots
P2	C	3 matches needed
1	B	Following a line
2	C	Equal division plus knowledge of tables
3	C	Knowledge of days of the week and some simple logic
4	A	Knowledge of how numbers behave when added together
5	D	Quick addition of the numbers 1 to 6 by either direct addition or averaging the first and the last and multiplying by how many numbers there are
6	A	Two step problem, find the weight of a bag of potatoes then find the weight of a bag of apples
7	A	Two step problem, result of a multiplication followed by using that answer to find the missing number
8	C	Noting where the pencil begins and ends on the ruler and calculating the difference
9	A	Either two subtractions, first to find the money spent then to find the cost of the drink; or add together the change and the cost of comic then subtract from the total money to get the cost of the drink
10	D	Units of time and knowledge of the 24 hour clock
11	B	Either draw the new path and count the black flagstones or notice that the vertical sides of the diagram will each increase by one black flagstone and the horizontal sides will stay the same
12	E	Application of division to real life, you can buy only full packets of cakes
13	E	Knowledge of simple ratio and addition of the results
14	E	Seeing directly that the total number of different meals is given by $5 \times 2$ or saying that for each sandwich there are 5 different fruits and so there must be 10 different meals or writing out all the combinations
15	D	Knowledge of time and solved by either subtraction or by adding on
16	B	Recognising the factors of 35 as 7 and 5 and because they add to give 12 these must be the numbers in question
17	D	The options are clearly the pair 1 and 3, and the pair 4 and 5. You can take solid 1 and place it physically into the space occupied by solid 3. Hence this pair constitute the answer because you cannot do this for solids 4 and 5. This pair are mirror reflections of each other in the same way that your left and right hand are mirror reflections of each other. And you cannot place your right hand into the space occupied by your left hand
18	A	Scaling up the given ratios
19	D	A logic puzzle. The Bricks have to be on the upper row since the Doll is directly below them. But also the Bricks have the Football to their left. Thus the top row reads, from left to right, Football, Bricks, Teddy bear. The Doll is directly below the Bricks and so occupies the middle space of the bottom row. If the Car is to have something to its left, it must go under the Teddy Bear and so the Doll is to the left of the Car
20	B	C and E can be discarded as possible answers immediately. C because there is no "length" on the shed floor that is 5 units or units long. E because it consists of 4 squares and the shed floor consists of 15 squares and 4 does not divide exactly into 15. A is not possible because once you have placed a shape such as A onto the shed floor you are wanting a shape with 3 units of length which A cannot provide. Of the other two choices, B is the one which works, covering the shed floor exactly with precisely 3 tiles and with no overlaps. ( <i>n.b. D works but only through flipping the tile over.</i> )