

# COLET COURT

## Mathematics Syllabus 8+ Examination

The syllabus is substantially in line with the National Curriculum Year 3 teaching programme. At the end of the syllabus more details are given regarding the structure of the Paper.

### NUMBER AND THE NUMBER SYSTEM

#### Counting, properties of numbers and number sequences

- Describe and extend number sequences.
- Count on or back in tens or hundreds, starting from any two or three-digit number.
- Count on or back in steps of any single digit number starting from any two-digit number.
- Recognise two-digit and three-digit multiples of 2, 5 or 10, and three-digit multiples of 50 and 100.

#### Place value and ordering

- Read and write whole numbers to any four-digit whole number in figures and words.
- Know what each digit represents, and partition three-digit numbers into a multiple of 100, a multiple of ten and ones (HTU).
- Use the vocabulary of comparing and ordering numbers, including ordinal numbers to 1000.
- Compare two given three-digit numbers, say which is more or less and give a number which lies between them.
- Say the number that is 1, 10 or 100 more or less than any given two or three-digit number.
- Order any four-digit whole number, and position it on a number line.

#### Estimating and rounding

- Use the vocabulary of estimation and approximation.
- Round any three-digit number to the nearest 10 or 100.

#### Fractions

- Recognise the unit fractions  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$  and  $\frac{1}{10}$ .
- Recognise simple fractions that are several parts of a whole, for example  $\frac{3}{4}$ ,  $\frac{2}{3}$  and  $\frac{3}{10}$ .

- Recognise simple equivalent fractions: for example, five tenths and one half, five fifths and one whole.
- Compare familiar fractions: for example, know that on the number line one half lies between one quarter and three quarters.
- Estimate a simple fraction of a given quantity.

## **CALCULATIONS**

### **Understanding addition and subtraction**

- Understand the operations of addition and subtraction, use the related vocabulary, and recognise that addition can be done in any order.
- Use the +, - and = signs, and recognise the use of a symbol such as  $\square$  or  $\Delta$  to stand for an unknown number.
- Add three or four single-digit numbers mentally, or three or four two-digit numbers with any appropriate method.
- Understand that subtraction is the inverse of addition.

### **Rapid recall of addition and subtraction facts**

- Know by heart:
  - all addition facts to a total of 30 and the corresponding subtraction facts.
  - all pairs of multiples of 100 with a total of 1000 (e.g. 300 + 700).
- Derive quickly:
  - all pairs of multiples of 5 with a total of 100 (e.g. 35 + 65).

### **Mental calculation strategies (+ and -)**

- Use a variety of methods to demonstrate an understanding of addition and subtraction.

### **Pencil and paper procedures (+ and -)**

- Use pencil and paper methods to support, record or explain  $HTU \pm TU$ ,  $HTU \pm HTU$ .
- Use column addition and subtraction for  $HTU \pm TU$  where the calculation cannot easily be done mentally.

### **Understanding multiplication and division**

- Understand multiplication as repeated addition.
- Use the related vocabulary.
- Understand that multiplication can be done in any order.
- Understand division as grouping (repeated subtraction) or sharing.
- Use the related vocabulary.
- Recognise that division is the inverse of multiplication, and that halving is the inverse of doubling.

- Find remainders after simple division.
- Round up or down after division, depending on the context.

### **Rapid recall of multiplication and division facts**

- Know by heart:
  - multiplication facts for the 2, 3, 4, 5, 6 and 10 times table.
- Derive quickly:
  - division facts corresponding to the 2, 3, 4, 5, 6 and 10 times table.
  - doubles of all whole numbers to 20 (e.g.  $17 + 17$  or  $17 \times 2$ ).
  - doubles of multiples of 5 to 100 (e.g.  $75 \times 2$ ,  $90 \times 2$ ).
  - doubles of multiples of 50 to 500 (e.g.  $450 \times 2$ ).
  - and all the corresponding halves (e.g.  $36 \div 2$ , half of 130,  $900 \div 2$ ).

### **Mental calculation strategies ( $\times$ and $\div$ )**

- Use a variety of methods to demonstrate an understanding of multiplication and division.
- Including multiplying by 10 or 100, shift the digits one or two places to the left.

### **Checking results of calculations**

- Use appropriate checking strategies.

## **MONEY, MEASURES, SHAPE AND SPACE**

### **Money and measures**

- Recognise all coins and notes.
- Understand and use  $\pounds$ .p notation (for example, know that  $\pounds 3.06$  is  $\pounds 3$  and 6p).
- Use the vocabulary related to length and mass.
- Measure and compare using standard units (mm, m, cm, kg, g), including using a ruler to draw and measure lines to the nearest half centimetre.
- Know the relationship between metres, centimetres and millimetres; kilograms and grams.
- Read scales to the nearest division (labelled or unlabelled).
- Use the vocabulary related to time.
- Use units of time and the relationships between them (second, minute, hour, day, week).
- Read the time to 5 minutes on an analogue clock and a 12-hour digital clock, and use the notation 9:40.

### **Shape and space**

- Use the mathematical names for common 2-D shapes, including square, rectangle, triangle, pentagon and hexagon.

- Use the mathematical names for common 3-D shapes; including cube, cuboid, cylinder and sphere.
- Refer to properties such as reflective symmetry, the number of sides, whether sides are the same length or parallel, whether or not angles are right angles.
- Identify and sketch lines of symmetry in simple shapes, and recognise shapes with no line of symmetry.
- Sketch the reflection of a simple shape in a mirror line along one edge.
- Use mathematical vocabulary to describe position, direction and movement: for example, describe and find the position of a square on a grid of squares with the rows and columns labelled.
- Make and describe right-angle turns.
- Identify right angles in 2-D shapes.
- Compare angles with a right angle.

## **SOLVING PROBLEMS**

### **Problems involving money and measures**

- Solve word problems involving numbers in money and measures, involving up to three steps.

### **Organising and using data**

- Solve a given problem by sorting, classifying and organising information in simple ways, such as:
  - in a list or simple table:
  - in a pictogram;
  - in a block graph.
- Discuss and explain results.

### **Making decisions**

- Choose and use appropriate operations of up to 3 steps (including multiplication and division) to solve word problems, and appropriate ways of calculating: mental, mental with jottings, pencil and paper.

### **Reasoning about numbers or shapes**

- Solve mathematical problems and puzzles, recognise patterns and relationships, generalise and predict.
- Investigate a general statement about familiar numbers or shapes by finding examples that satisfy it and / or counter examples.
- Explain methods and reasoning.

## Structure of the Paper

The Maths paper is split into 3 sections:

- **Section A** is a 15 question aural mental arithmetic test; questions are graduated in difficulty and there is a time restriction for each question
- **Section B** tests core pen and paper techniques (calculations) and a thorough understanding of number and the number system; the marks are equally weighted for both components
- **Section C** has a mixture of worded questions set in context and tests an ability to solve longer problems; this section is more challenging

The mental arithmetic section lasts about 10 minutes and the next two sections last 30 minutes in total.

Candidates must realise the importance of showing clear working and should not simply write down an answer.

In the lead up to the exams, it is hoped that a boy's programme of study will be enriched rather than accelerated. More than anything, we are looking for boys who exhibit facility with number and who have the ability to analyse problems and apply familiar techniques in unfamiliar situations.