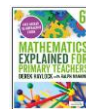


## Maths Audit Instructions 2025-26

Please complete this audit (this is not a test; we expect you to undertake self-study in the process of completing this audit). Please complete in your own words but consult references such as [Mathematics Explained](#) by Derek Haylock.



Web sites such as NCETM <https://www.ncetm.org.uk/> and NRICH <https://nrich.maths.org/> may also be useful. Resources and links are provided within the audit to support you in answering individual questions (these are in italics after relevant questions), use these links alongside relevant chapters in Haylock's (2019) *Mathematics Explained*:  
<https://elevate.talis.com/roehampton/player/modules/6287953dc750a8cca448715a/epubs/645bc1acba85f045fdca6d60?chapter=0>

Once you start the course at university you can support one another to explore your solutions further, before you hand in. We are really looking for clear explanations in your own words with helpful illustrations.

PLEASE EITHER **TYPE OR WRITE** ON SEPARATE PAPER PROVIDING NEAT, WELL SPACED, LEGIBLE EXPLANATIONS WITH ILLUSTRATIONS.

You will hand in your completed **action plan (attached to this audit) and self-study** with your audit to your maths tutor early in the autumn term. It is a good idea to begin your self-study and start this audit in advance of the course.

## Mathematics Audit 2025-26

### NUMBER

#### 1. Counting and Place Value

1a)

• • • • •

A child counts how many dots above. Which counting principles do they use?

Please read: <https://prek-math-te.stanford.edu/system/files/media/document/2017/The%20Principal%20Counting%20Principles.pdf>

1b) A child lacks a sense of 'conservation' when they say, "There are more pencils than animals." What does this mean?



1c) When asked, 'how many?' a child is able to respond quickly and correctly with "5" each time, **without counting**. How is this possible?



**1d)** You ask a pupil to count out 23 cubes, which she does successfully. You then ask her to show you how many cubes are represented by the 3 in 23 and she counts out 3 cubes. You then ask her to show you how many cubes are represented by the 2 in 23 and she counts out 2 cubes. What difficulty is this pupil having? (See *Haylock and Manning's chapter on Place Value in Mathematics Explained* (any edition))

**See also NCETM Self Audit Questions:**

**<https://www.ncetm.org.uk/classroom-resources/pska-number/>**

## 2. Fractions, decimals, percentages and ratio

- a) Which is larger: 0.735 or 0.74, how do you know?
- b) A vegetable patch is planted with potatoes, cabbages and carrots.  $\frac{2}{3}$  of the garden is planted with potatoes and  $\frac{1}{4}$  of the garden is planted with cabbages. What fraction of the garden is planted with carrots? **Use a bar model to explain your answer.**

<https://mathsframe.co.uk/en/resources/resource/402/ITP-Fractions>

- c) Which of these percentages is equal to 0.26?  
0.26%,            2.6%,            26%,            260%  
Explain why, using place value.

- d) There are five toffees to every two chocolates in a box of 28 sweets. How many chocolates are there? **Explain how you worked it out.**

**See also NCETM Self Audit Questions:**

<https://www.ncetm.org.uk/classroom-resources/pska-fractions/>

### 3. Calculation

Understanding operations:

- a) Write two stories for 10 divided by 2 ( $10 \div 2 = ?$ ) to illustrate the difference between sharing (*partitive*) and grouping (*quotative*)  
(See *Haylock, Mathematics Explained (any edition) for definitions of division structures*)
  
- b) Read <https://nrich.maths.org/articles/multiplication-series-illustrating-number-properties-arrays> and Illustrate  $3 \times 4$  using an array
  
  
  
- c) Read <https://nrich.maths.org/8773> Show  $96 \div 6$  using an open array
  
  
  
- d) What might a child need to know and understand to answer this missing number problem:  $100 - ? = 52$

#### 4. Mental Strategies

a) Use different strategies to calculate  $182 - 97$  and show these different strategies on an empty number line or use another model:

- I. partition and bridge
- II. counting up
- III. rounding and compensating
- IV. same difference

*(Subtraction strategies explained:*

<https://www.youtube.com/playlist?list=PLn0hWliHk5d7QYSQFt2yQzu2sgzm1-zbk>)

b) A child at my school is nine years old. She says she is 30 000 days old. Is that possible? Without calculating the exact answer, explain why.

- i. Yes
- ii. No
- iii. Maybe

c) *Without calculating the exact answer*, select the best estimate for:  $21 \times 19$   
Say why.

- i. 299
- ii. 399
- iii. 499

d) *Without calculating the exact answer*, select the best answer for:  $29 \times 0.98$   
Say why?

- i. more than 29
- ii. less than 29

e) *Without calculating the exact answer*, identify the largest number? Say how you worked it out.

- i.  $29 + 0.8$
- ii.  $29 \times 0.8$
- iii.  $29 \div 0.8$
- iv.  $29 - 0.8$

f) Using a number line as a model to show your working, calculate the time spent on homework if I start working at 17:15 and finish at 9.07pm the same day.

## 5. Written calculations

- a. Calculate  $325 \times 34$  using the grid method **and** using a formal written method. (*This video demonstrates both the grid method and long multiplication: [https://www.youtube.com/watch?v=5ppOF53x\\_q0](https://www.youtube.com/watch?v=5ppOF53x_q0)*)
- b. Calculate  $7214 \div 21$  using knowledge of multiplication facts and place value **and** also using a formal method

(See part 4 of *Teaching Written Calculation* which can be downloaded using this link: <https://www.stem.org.uk/elibrary/resource/29220>)

## 6. Laws of arithmetic & relationships

- a) Explain the **commutative** law and **distributive** law, including which operations they apply to and **give examples**. (See *Haylock and Manning (any edition) Mathematics Explained*)
- b)  $930 \times 134$  is equal to 124620. Use this to find the answer to:  $124620 \div 93$   
Show your working.
- c) The farmer has stored all his apples in 80 boxes with 40 apples in each box. He now needs to repack them all into 40 new boxes. How many apples will there be in each box? **Explain your working and relate to 6a.**
- d)  $93 \times 134$  is equal to 12462. Use this to write the answer to:  $93 \times 135$ . **Explain your working and relate to 6a.**

See also NCETM Self Audit Questions:

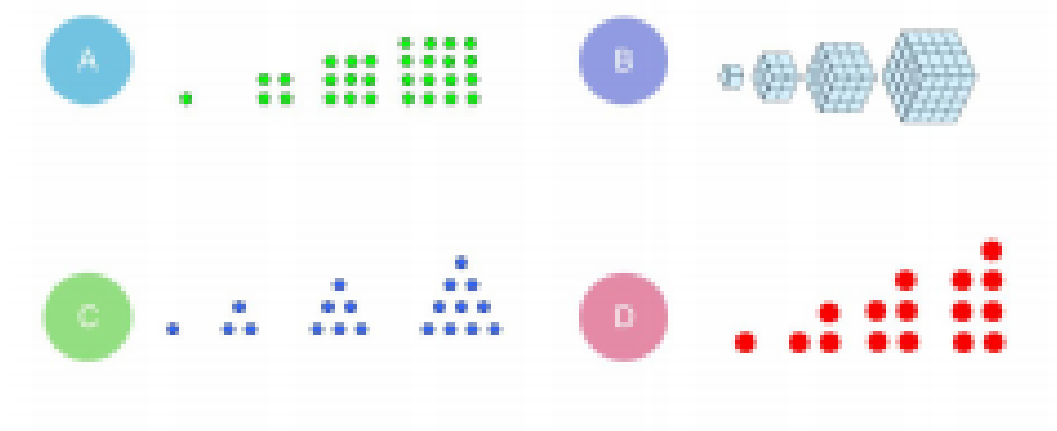
<https://www.ncetm.org.uk/classroom-resources/pska-multiplicative-reasoning/>

See also NCETM Self Audit Questions:

<https://www.ncetm.org.uk/classroom-resources/pska-additive-reasoning/>



7. Pattern and algebra: draw and identify how many counters or cubes would be needed for the fifth in the sequence, for each of the growing patterns A, B, C and D below:



(Link to articles about pattern in mathematics: <https://nrich.maths.org/9968>)

## 8. Statistics and Sorting Data

- a) A teacher calculated the mean points score achieved by pupils in an end of Key Stage 2 mathematics test.  
There were 48 pupils in the year group.

The mean points score is given by the formula:

$$\text{Mean points score} = \frac{\text{total points for the year group}}{\text{total number of pupils in the group}}$$

Level achieved	Number of pupils	Points per level	Total points per level
3	5	21	105
4	29	27	783
5	8	33	
6	6	39	
<b>Total</b>	48		

What was the mean points score for the year group?

Give your answer to the nearest whole number.

The total points for Levels 3 and 4 have been done for you.

**8b) Draw and use** a Venn and Carroll Diagram to sort multiples of 2 and multiples of 5.

- i) Carroll diagram
- ii) Venn diagram

## 9. Measures

### a) Metric-imperial conversions

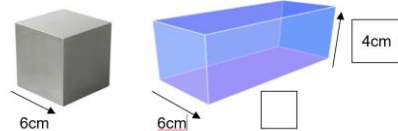
- Which is further: half a mile or one kilometre? Explain how to calculate this.
- The scale of a map is 1: 200 000. What is 1cm equivalent to in km? Explain how you calculated this.
- How tall are you in feet and inches? Convert this into metres and centimetres. Explain how you calculated this.

### b) Metric units and relationships

I. How many centimetres are there in a metre and a kilometre?

II. How many millilitres are in half a litre?

**c) Volume:** If the cube and the cuboid are the same volume, calculate the missing length on the cuboid.



## 10. SHAPE AND SPACE (*please see Haylock's shape classification chapter*)

### a) Regularity and irregularity

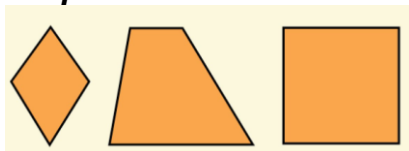
Draw (using a ruler) a *regular* and an *irregular* example of each of these:

- I. triangle
- II. rectangle
- III. octagon

### b) Polygons - names and relationships

I. Draw (using a ruler) an isosceles triangle and an isosceles trapezium

II. Which of the shapes below are parallelograms. Explain how you know using an understanding of classification. ***Please see Haylock's shape classification chapter***



### c) 3D shapes – names and properties

Draw each of these (using a ruler), say how many faces, vertices and edges they have:

- I. a cuboid
- II. a pentagonal prism
- III. a square based pyramid

Name:

## Action Plan

**Complete this action plan and hand in with audit and self-study.** When completing this action plan ensure you specify the aspects of mathematics for which further self-study is needed or have already been undertaken. **Identify the action of self-study:** if more work on fractions is needed, indicate the action, e.g. types of worked examples from Haylock workbook or refer to a specific reading. Your self-study should then include notes from readings or actual worked examples that you have done.

AUDIT	Record of action of self-study	Evidence seen (tutor to sign)
1.Counting and Place Value		
2. Fractions, decimals, percentages and ratio		
3.Calculation		
4. Mental Strategies		
5. Written Methods		
6. Laws of arithmetic and relationships		
7. Patterns and algebra		
8. Statistics and Sorting Data		
9. Measures		
10. Shape and Space		
Tutor signature		