Contents

Introduction

About the series

Cosmic Maths is a series written by teachers to develop core mathematical knowledge and skills using a guided three-step process to help children understand, apply and further practise mathematical concepts.

The series covers the Key Objectives set out in the new *National Curriculum* for each year group and focuses on Number, Fractions and Statistics and the use and practical application of the four operations: adding, subtracting, multiplying and dividing.

Intended for Key Stage 2 children, with many activities also suitable for lower Key Stage 3, the series comprises four books and CDs:

Cosmic Maths – *Year 3 (Ages 7-8)*

Cosmic Maths – *Year 4 (Ages 8-9)*

Cosmic Maths – *Year 5 (Ages 9-10)*

Cosmic Maths – *Year 6 (Ages 10-11)*

About the books

Each book contains up to 18 lesson plans with teachers' notes and definition of key vocabulary and mathematical terms. Each lesson plan uses a guided three-step process as follows:

Prepare to launch

A **short mental activity** is given to help prepare your learners launch into the guided activity.

Lift off

The **guided activity** then supports and encourages the children as they explore numbers through a range of exciting and fun activities.*

Into orbit and safe landing

This is then followed up with an **independent** and an **assessment activity** that allow children to practise what they have learnt, as well as providing evidence of the level of each pupil's understanding. They also offer an opportunity for teacher-pupil assessment to take place.

A further **extension activity** for use in class or as homework is also included, in order to give essential practice when embedding core mathematical skills and knowledge associated with each lesson. This provides a valuable stimulus for further discussion and class work in the future.

It is important to note that a wide range of practical problem solving activities is covered, many of which are cross-curricular, in order to give learners a wider view of how maths, especially number, can be used and applied in the 'real' world.

Answers *to all activities are given in full towards the back of each book.*

The CD

Each book includes a CD that contains **differentiated** lessons and activities for higher and lower abilities as well as an **assessment test** (also in the book) and a **skills report**.

Cosmic Maths helps make the teaching and learning of Mathematics both meaningful and fun, allowing each and every learner rocket towards success!

National Curriculum Objectives: Year Three

Number	Count from 0 in multiples of 4, 8, 50, 100; find 10 or 100 more or less than a given number.
	Recognise the place value in a 3-digit number.
	Compare and order numbers up to 1000.
	Identify, represent and estimate numbers using different representations.
	Read and write numbers up to 1000 in numbers/words.
Addition and subtraction	Add/subtract numbers mentally including 3-digits and 1s (or units), 3-digits and 10s, 3-digits and 100s. Add/subtract numbers with up to 3 digits using formal written methods of columnar addition and subtraction.
	Estimate the answer to a calculation and use inverse operations to check answers.
	Solve problems including missing number problems using number facts and place value. More complex addition/subtraction.
Multiplication and division	Recall and use multiplication and division facts for the 3, 4 and 8x tables.
	Write and calculate maths statements for multiplication and division using the times tables known including TU x U from mental through to formal written methods.
	Solve problems including missing number problems involving multiplication and division including integer scaling problems and correspondence problems in which n objects are connected to m objects.
Fractions	Count up and down in tenths; recognise tenths arise from dividing an object into 10 equal parts and in dividing 1-digit numbers or quantities by 10.
	Recognise, find and write fractions of a discrete set of objects; unit fractions and non-unit fractions with small denominators; recognise and use fractions as numbers; unit fractions and non-unit fractions with small denominators.
	Recognise and show, using diagrams, equivalent fractions with small denominators.
	Add/subtract fractions with the same denominators within one whole.
	Compare and order unit fractions and fractions with the same denominators.
Statistics	Interpret and present data using bar charts, pictograms and tables.
	Solve one-step and two-step questions (How many more? How many fewer?) using information from scaled bar charts, pictograms and tables.

Flying banners

National curriculum objective

Count from 0 in multiples of 4, 8, 50, 100; find 10 or 100 more or less than a given number.

Teacher's notes

Make sure that when adding and subtracting either 10 or 100, pupils are carrying out the calculation in the correct column. Also guard against a tendency to add/subtract 10/100 from several of the columns instead of only one.

Key vocabulary

Multiples are collections of equal groups. For example, 4, 8, 12, 16, 20, 24 etc. are multiples of 4. Four will divide exactly into any of them. The multiples of 50 start 50, 100, 150, 200, 250 and so on while the multiples of 100 go 100, 200, 300, 400, 500, 600 etc.

Prepare to launch: (Warm up activity)

Tell pupils they are going to add three or four small numbers mentally. Tell them to make it easier they should first find a pair of the numbers to make 10. Stress the idea that changing the order of numbers when adding mentally can be very useful. Start with these groups of numbers: 2 + 8 + 5; 4 + 9 + 1; 8 + 6 + 2; 5 + 3 + 7; 7 + 5 + 5; 9 + 4 + 6; 2 + 3 + 5 + 8; 3 + 7 + 8.

Lift off: (Guided activity)

Play the game called 'Clap counter'. Start at zero and count up in multiples of 50s. When you clap your hands children count back from the number, reversing the direction of the count on each clap.

For example: 0, 50, 100, 150, 200, 250, 300, clap, 250, 200, 150, 100, clap, 150, 200, 250, 300, 350, 400 etc.

Repeat the process with multiples of 100. For example: 0, 100, 200, 300, 400, 500, clap, 400, 300, 200, 100, clap, 200, 300, 400, 500, 600, 700 etc. Include some instances of going over the 1000 marker.

Then add and subtract 10 from certain start numbers. For example: What is 10 more than 86, 103, 244, 592? What is 10 less than 32, 101, 205, 413?

Carry out the same process with 100. What is 100 more than 96, 124, 305, 611? What is 100 less than 107, 289, 312, 670, 1003?

Into orbit: (Independent activity)

Set this number investigation for pupils to do.

Make up some number sequence questions involving counting in 10s and counting in 100s that can be passed over to your friend to answer. Include questions like the following:

Fill in the gaps: 121, _____, _____, 151;
378, _____, _____, _____, 348

Put in the next three numbers: 413, 423, 433, 443_____;
979, 879, 779, 679, _____

Start at 115 and count up in 10s for 7 numbers. Start at 841 and count down in hundreds for 6 numbers.

★ Lead into and complete the independent activity ***Into orbit: Flying banners*** on page 9.

Safe landing: (Assessment activity)

Pupils should fill in the missing numbers in the number grid on page 8. Some have been completed already to get them started. What calculations do the words 'more' and 'less' indicate? Which are the best strategies to use mentally when adding and subtracting 10 or 100?

★ Lead into and complete assessment activity ***Safe Landing: Flying banners*** on page 10.

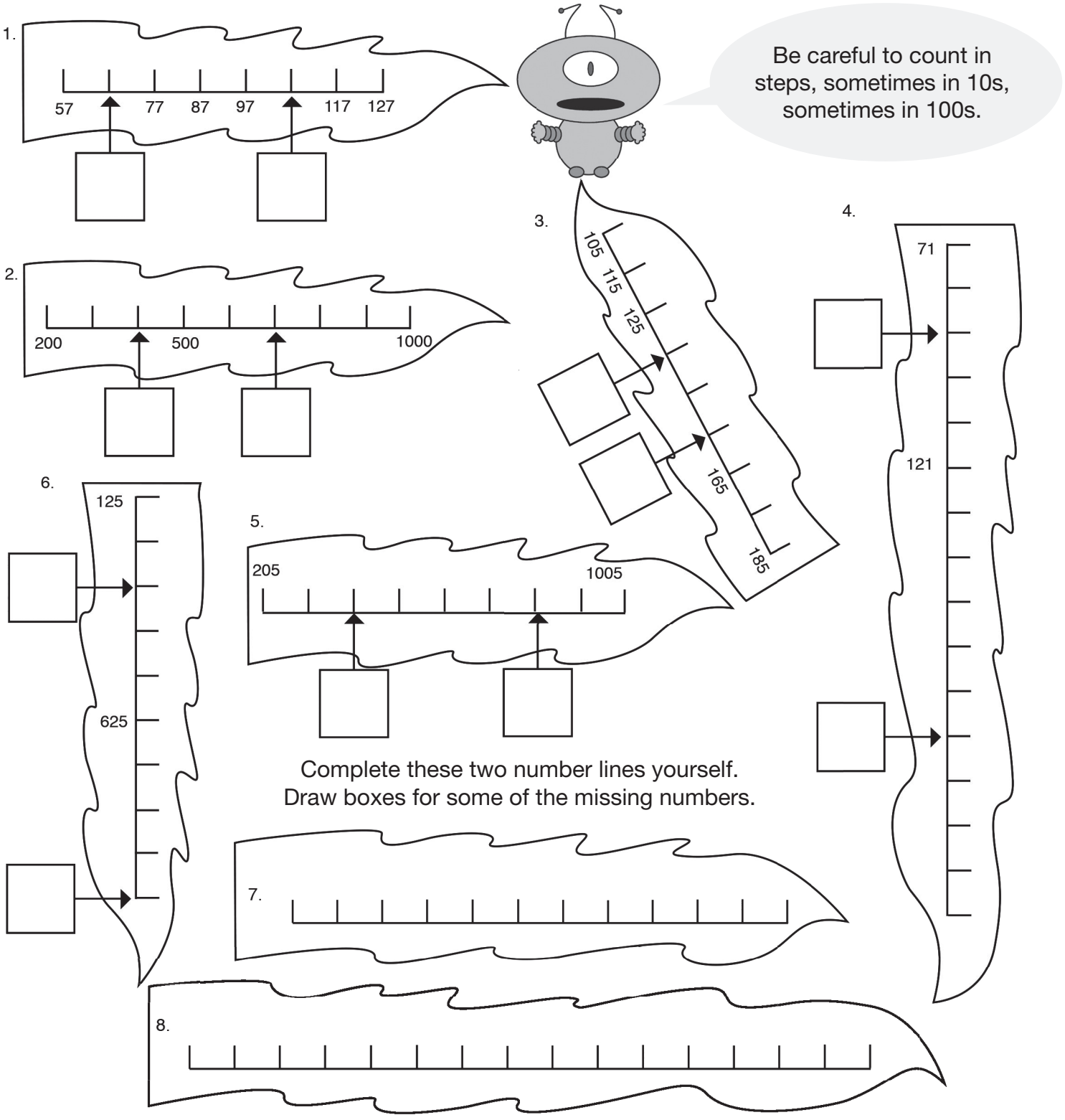
Extension opportunity/Homework

Ask pupils to make up some number sequences using numbers other than 10 or 100. For example, ask them to write the first eight terms of each of these number sequences. Start at 4, add 3; Start at 76, subtract 7; Start at 3, double; Start at 256, halve.

Flying banners

Name: _____ Date: _____

Here are some number lines. Not all the numbers are shown. Fill in the boxes to show what numbers should be on the number line where the arrows point.



Flying banners

Name: _____ Date: _____

Fill in the missing numbers in the grid.

Number	10 more is	100 more is	10 less is	100 less is
130	140			30
157			147	
249				
309		409		
594				
602	612			
799		899		
952				
1256			1246	
3071				2971

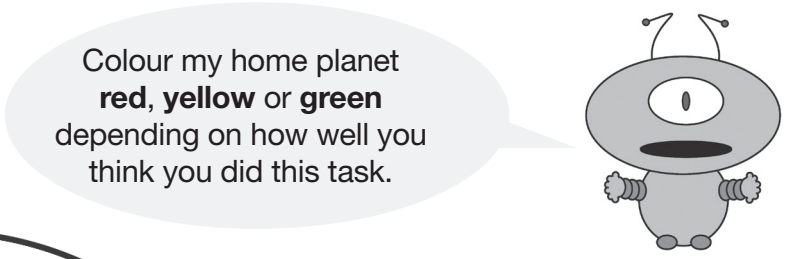
Flying banners

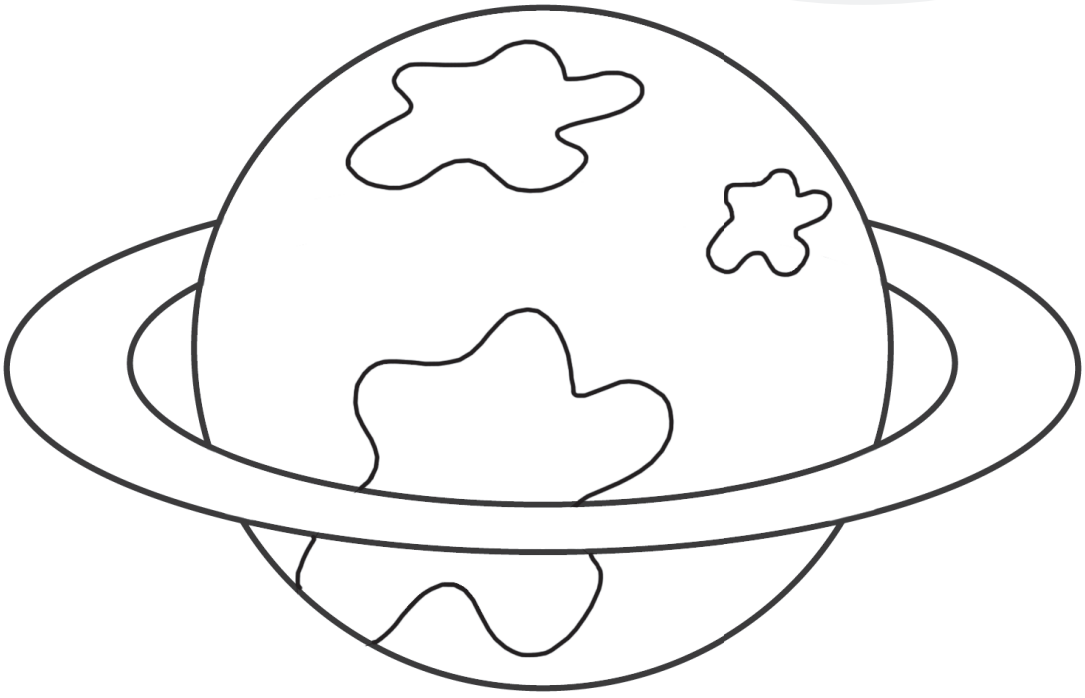
Name: _____ Date: _____

Learning objectives:
Count from 0 in multiples of 4, 8, 50, 100; find 10 or 100 more or less than a given number.

Self assessment

☐ I found this hard and would like help. (red)
☐ I could do some of this but would like more practice. (yellow)
☐ I found this easy and am ready to go to the next step. (green)





Teacher's notes: