Cosmic Maths

Year 4

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National Curriculum Objectives: Year Four

Number	Count in multiples of 6, 7, 9, 25 and 1000.
	Find 1000 more/less than a given number.
	Count backwards through zero to include negative numbers.
	Recognise the place value of each digit in a 4-digit number (1000s, 100s, 10s, 1s)
	Order and compare numbers beyond 1000.
	Identify, represent, estimate numbers using different representations. Round any number to the nearest 10, 100, 1000.
	Solve number and practical problems that involve all the above and with increasingly large positive numbers.
	Read Roman numerals to 100 and know that over time the numeral system changed to include the concept or zero and place value.
Addition and subtraction	Add/subtract numbers with up to 4-digits using the formal written method of columnar addition/subtraction where appropriate.
	Estimate and use inverse operations to check answers to calculations.
	Solve addition/subtraction two-step problems in contexts deciding which operations and methods to use and why.
Multiplication and division	Recall multiplication and division facts for x tables up to 12 x 12.
	Use place value, known and derived facts, to x and ÷ mentally including x 0, x 1, ÷ 1, x together 3 numbers. Recognise and use factor pairs and commutativity in mental calculations.
	Multiply TU and HTU by U using formal written layout.
	Solve problems involving x and ÷ including using the distributive law to x TU by U; integer scaling problems and harder; correspondence problems such as n objects are connected to m objects.
Fractions	Recognise and show, using diagrams, families of common equivalent fractions.
	Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10.
	Solve problems involving increasingly harder fractions to calculate quantities and fractions to divide quantities including non-unit fractions when the answer is a whole number.
	Add/subtract fractions with the same denominator.
	Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents of 1/4, 1/2, 3/4.
	Find the effect of dividing a 1 or 2-digit number by 10 and 100; identify the value of the digits in the answer as units, tenths and hundredths.
	Round decimals with one decimal place to the nearest whole number. Compare numbers with the same number of decimal places, up to two decimal places.
	Solve simple measure and money problems involving fractions and decimals to two decimal places.
Statistics	Interpret and present discrete and continuous data using appropriate graphical methods including bar charts and line graphs.
	Solve comparison and difference problems using information in bars charts, pictograms, tables and other graphs.

Step ladders

National Curriculum Objective:

Count in multiples of 6, 7, 9, 25 and 100.

Teachers' notes:

Point out that the 6x and 9x tables are related to each other and are a continuation of the 3x table that pupils already know. Multiples of 6 and 9 should be taught first and multiples of 7 treated on their own as they are really a stand-alone group. Make pupils aware that 25 is a quarter of 100, that two 25s make 50 and that four 25s make 100. Extend the counting of 1000s into the tens of 1000s and hundreds of 1000s at this level, if possible.

Key vocabulary:

The word times is sometimes used in place of **multiply** or **multiplied**. For example: 5 times 7 is 35. Introduce the use of the word **product** as the answer to a multiplication calculation and **quotient** as the solution to a division calculation. For example: The product of 4 and 6 is 24. The quotient of 20 and 5 is 4. **Multiples** are collections of equal groups. For example: The multiples of 6 are 6, 12, 18, 24, 30, 36 and so on.

Prepare to launch: (Warm up activity)

Play the game called 'Clap counter'. Start at zero and count up in multiples of 25. When you clap your hands the pupils count back from the number reversing the direction of the count on each clap. For example: 0, 25, 50, 75, 100, 125, 150, clap, 125, 100, 75, 50, clap, 75, 100, 125, 150, 175 etc. Repeat the process for 1000s. Have several different starting points so that 1000s in the 10000s and 100000s are also included. For example: 52000, 53000, 54000, 55000, clap, 54000, 53000, 52000, 51000, 50000, 49000; 207000, 208000, 209000, 210000, 211000, clap, 210000, 209000, 208000, 207000, 206000, 205000.

Lift off: (Guided activity)

Chant through the 6x table from 6 to 72 and then back again. Ask questions to do random checks. For example: What number comes before 36? What number comes after 48? Point out that multiples of 6 can be found by doubling multiples of 3. For example: 4 x 6 = 4 x 3 x 2 = 24. Repeat the process using the 9x table. Then move on to look at the 7x table as far as 84. It may be necessary to write up the 7x table on the IWB to help initially. Cover up some of the numbers as pupils chant through this table to help them become more familiar with it.

Into orbit: (Independent activity)

Ask pupils to make links between the 3x, 6x and 9x table family. On squared paper, ask them to write down the tables, 3x from 3 to 36, 6x from 6 to 72 and 9x from 9 to 108. Ask the following questions: Which numbers appear on the 3x and 6x tables? Which appear on the 6x and 9x tables? Which numbers appear on the 3x, 6x and 9x tables? They could use coloured pencils to help with their coding system.

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

Safe landing: (Assessment activity)

Test pupils with some quick-fire mental questions from the 6x, 9x and 7x tables that they have been working on. Test both the multiplication and division facts and extend vocabulary by using as many different words as possible. Pupils complete the assessment activity individually.

★ Lead into and complete assessment activity *Safe landing: Step ladders* on page 10.

Extension opportunity/homework:

Show pupils the finger counting method of calculating the multiples of nine. Get them to hold both hands in front of them, palm facing towards them. Point out that thumbs are counted with fingers in this method. Try 4 x 9. Bend down the fourth digit from the left on the left hand. This leaves three fingers on the left of it and six fingers on the right of it. So 4 x 9 = 36. Try 9 x 9. Bend and hold down the ninth finger. This leaves eight fingers to the left and one finger to the right. So 9 x 9 = 81. (See illustration below) Encourage pupils to demonstrate the method to others.
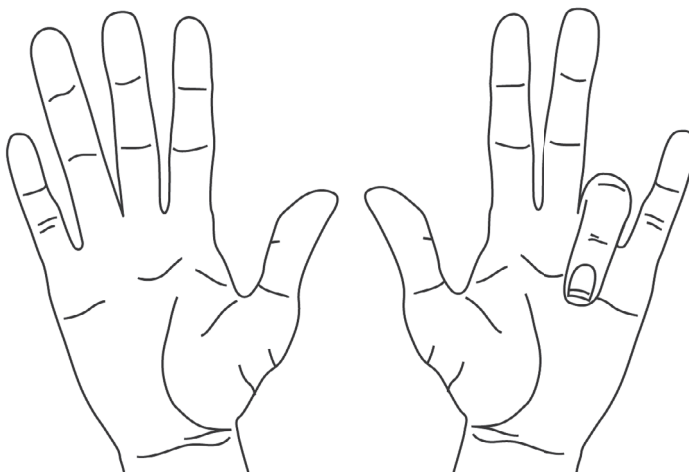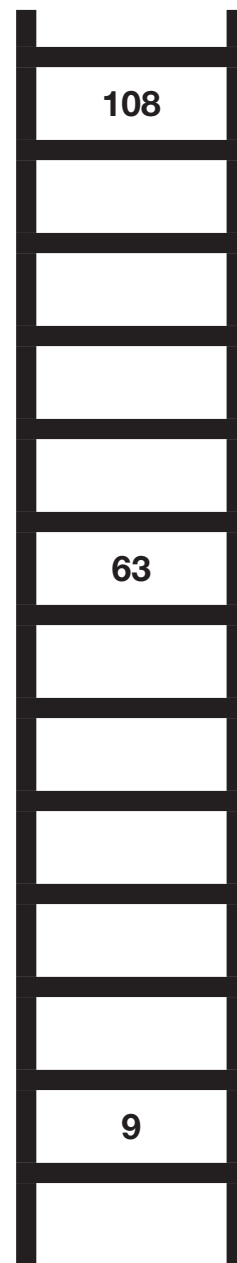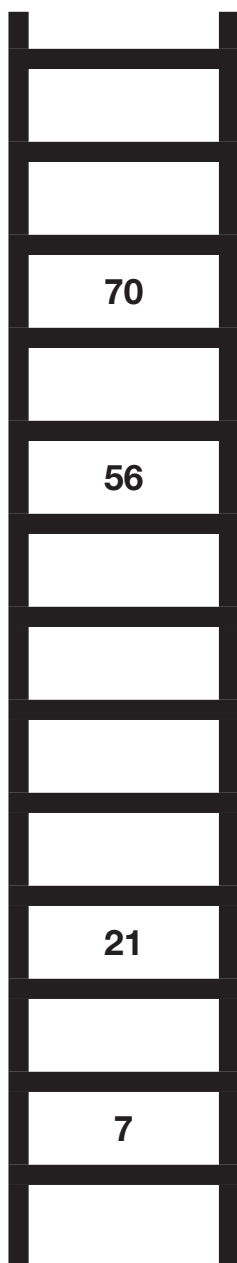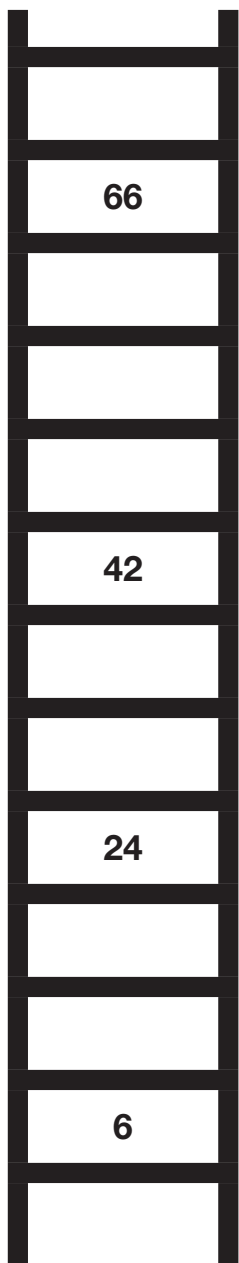
Step ladders

Name: _____ Date: _____

Write in the missing numbers on these step ladders. Some of the numbers have been put in for you. What patterns can you see in the end digits of both the 6x and the 9x tables?
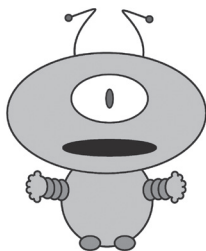
Make sure you know your 6, 7 and 9x tables before starting to fill in these ladders.

Ladder 1

66
42
24
6

Ladder 2

70
56
21
7

Ladder 3

108
63
9

Step ladders

Name: _____ Date: _____

Answer these quick fire mental questions from the 6x, 7x and 9x tables.
Look at the words that are used carefully. Complete this assessment test on your own.

1. 4 x 6

2. 7 multiplied by 9

3. Multiply 7 by 5

4. What are 8 sixes?

5. 2 times 9

6. 81 divided by 9

7. How many sixes are there in 18?

8. Divide 21 by 7

9. How many nines in 45?

10. 42 divided by 6

11. What is the product of 6 and 7?

12. What is the quotient of 56 and 8?

Step ladders

Name: _____ Date: _____

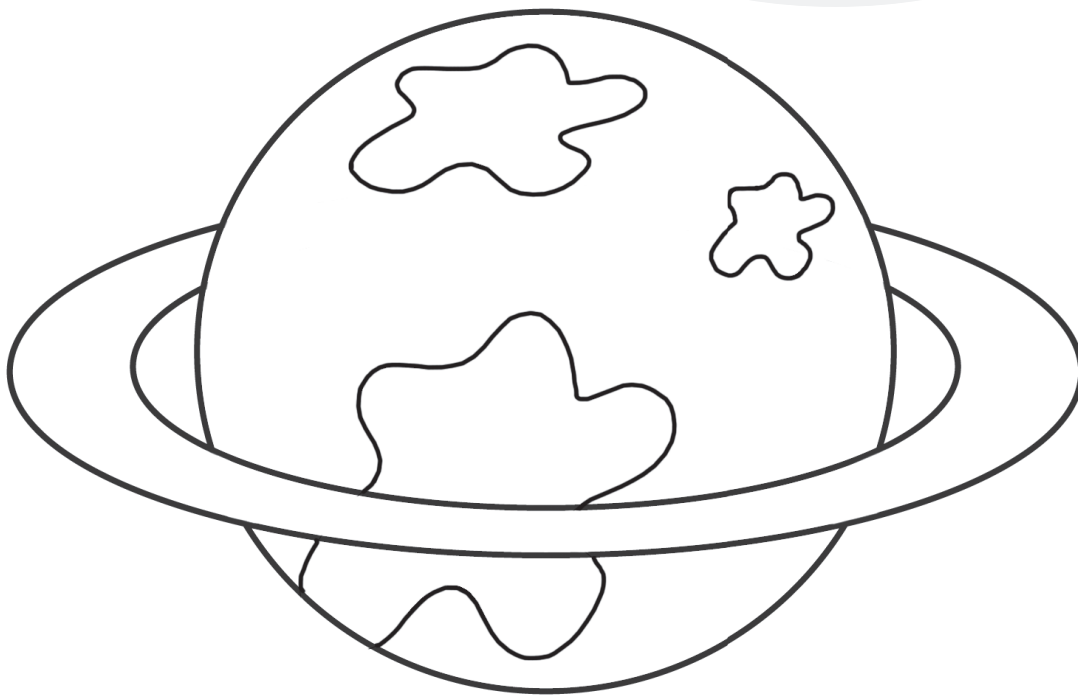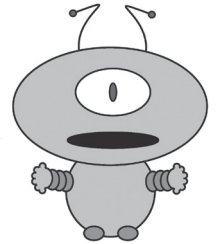
Learning objective:
Count in multiples of 6, 7, 9, 25 and 100.

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)

Colour my home planet **red**, **yellow** or **green** depending on how well you think you did this task.

Teacher's notes: