

Number and Place Value: Counting in Powers of Ten

Aim: Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. To count in steps of powers of ten.	Success Criteria: I can identify the value of each digit in a number. I can identify which digit will change when adding or subtracting a power of 10. I can count forwards and backwards in steps of powers of 10.	Resources: Lesson Pack
	Key/New Words: Number, place value, digit, count, power, index number.	Preparation: Differentiated Counting Maze Activity Sheet - one per child Differentiated Giant Number Cards - one per group Diving into Mastery Activity Sheets - as required

Prior Learning: It will be helpful if children have covered place value of numbers up to 1 000 000, as well as reading and writing numbers.

Learning Sequence

	Remember It: Children compare and order numbers into number sentences shown on the Lesson Presentation .	
	Powers of 10: Share the powers of 10 as shown on the Lesson Presentation . Children discuss the pattern and any observations. Explain the powers of 10 and how they can be calculated, referring to the Lesson Presentation . Children follow the explanation to find 10^4 , 10^5 and 10^6 . Share the answers and discuss any misconceptions. Can children identify powers of 10?	
	Adding and Subtracting: Use the Lesson Presentation to explain how to add or subtract a given power of 10 from a number. Model using the place value grid to identify the digit in the given place. Children choose two of the calculations from the differentiated table on the Lesson Presentation . Share the answers and discuss. Can children identify the value of the digit they need to change when calculating with powers of 10?	
	Forwards and Backwards: Refer to the Lesson Presentation to explain how we can use these addition and subtraction skills to count forwards and backwards in steps of powers of 10. Children try the two examples. Can children count forwards and backwards in steps of powers of 10?	
	Which Power of 10? Share the sequences shown on the Lesson Presentation . Children identify the power of 10 in which each sequence is increasing or decreasing. Share and discuss the answers.	
	Counting Maze: Children move through the maze on the differentiated Counting Maze Activity Sheet by counting forwards and backwards in steps of powers of 10. Can children count in steps of powers of 10? Numbers up to 100 000. Numbers up to 1 000 000. Numbers up to 10 000 000.	
	Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.	
	Children solve fluency questions, counting forwards and backwards in powers of 10, 100 and 1000.	
	Children use reasoning and problem-solving skills to identify and correct false statements in given sequences where powers of 10 have been applied. They justify their responses with mathematical evidence where appropriate.	
	Children solve contextualised problems where counting forwards and backwards in powers of up to 10 000 is required.	



Giant Number Order: Give each group a pack of the differentiated **Giant Number Cards**. Ensure that the cards are mixed up and not in order. Each pack of **Giant Number Cards** consists of three sets, or sequences of powers of 10. **Can children sort the cards into the three sets and then order each set?**



Numbers up to 100
000.



Numbers up to 1 000
000.



Numbers up to 10 000
000.

Explore it

Solve it: Use this _____ to solve problems involving counting in steps of powers of 10.

Count it: Children count on in steps of powers of 10 using these differentiated _____.

Learn it: Children will find this visually exciting _____ a useful tool for improving their knowledge of place value with numbers up to 1 000 000.