Number and Place Value: Powers of 10 Rounding

Aim:	**Success Criteria:**	**Resources:**
To round any whole number to a required degree of accuracy. DfE Ready-to-Progress Criteria: Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. (6NPV–3) To round numbers to a required degree of accuracy.	I can find the midpoint on a number line when rounding. I can use the midpoint to determine whether a number should be rounded up or down. I can identify which digits to round up and which digits to round down.	Lesson Pack Paper clip - per pair Dice - per pair
	Key/New Words: Round, digit, place value, ten, hundred, thousand, ten thousand, hundred thousand, million, accuracy, number line, midpoint.	**Preparation:** Differentiated Robot Rounding Activity Sheet - per pair Blank Number Lines - as required Extra Challenge Activity Sheet - as required Diving into Mastery Activity Sheets - as required

Prior Learning: It will be helpful if children have covered place value of numbers up to 10 000 000.

Learning Sequence

	**Remember It:** Children complete calculations shown on the Lesson Presentation by adding the correct mathematical terms to each number sentence.	
	**Rounding:** Referring to the Lesson Presentation, introduce rounding and explain why it is useful.	
	**Rounding Accurately:** Use the Lesson Presentation to explain how to round numbers to a given degree of accuracy using number lines. Using the Lesson Presentation, children explore how number lines can be used when rounding numbers up to 1 000 000. They round numbers with up to six digits using the midpoint to help establish whether the number should be rounded up or down. Can children use number lines to determine whether a number is rounded up or down?	
	**Robot Rounding:** Introduce the robot shown on the Lesson Presentation and explain that its job is to round any number to a required degree of accuracy. Can children round each robot's number to the degree of accuracy shown on the dial? Choose children to click on each robot to reveal the answers.	
	**Robot Rounding Activity:** Children use the dial on the differentiated Robot Rounding Activity Sheet to play a rounding game. Children use a paper clip and pencil as described on the Lesson Presentation to use the dial to find the degree of accuracy to round each number to. Children record their answers in the tables on the sheet, depending on whether they are Player 1 or Player 2. Can children round the numbers to the required degrees of accuracy?  Use numbers to 1 000 000. Round to the nearest 10 000.  Use numbers to 10 000 000. Round to the nearest 100 000.  Use numbers to 10 000 000. Round to the nearest 1 000 000. An Extra Challenge Activity Sheet is provided as an extension activity if required.	

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 complete fluency problems when rounding numbers up to ten million.

Children explore reasoning problems involving rounding numbers up to ten million and discuss their reasoning.

Children use problem-solving skills in order to answer an open-ended task that involves a greater depth of thinking when rounding with numbers up to ten million.

Rounding and Reasoning: Children answer contextualized questions on the **Lesson Presentation**, where numbers are rounded to given degrees of accuracy. They continue to identify how numbers are rounded on number lines, while attempting to mentally identify whether a given number should be rounded up or down. Children work with partners to identify numbers which round to one million when rounded to the nearest 10, 100, 1 000, 10 000 and 100 000. They feedback findings and compare results with others using answers on the **Lesson Presentation**. **Can children identify which digits to round up and which digits to round down using visual or abstract methods?**

Exploreit

Roundit: Use this **Activity Sheet** to round numbers to a required degree of accuracy, and to suggest possible numbers that could have been rounded.

Findit: Children roll a five, six or seven-digit number. Children round the number they make to the nearest ten thousand, hundred thousand or million. Can they then roll another number that rounds to the same ten thousand, hundred thousand or million?

Learnit: Children will find this visually exciting **Knowledge Organiser** a useful tool for enhancing their knowledge of place value. Additionally, children will benefit from reading the designated rounding section, consolidating learning in this lesson.