Year 5 – Becoming an 'exceeding Mathematician'

We have put together the following guide to help our parents and carers support their children at home with Maths and help them become an 'exceeding Mathematician'! An 'exceeding Mathematician' is a child that has mastered the content of their year group curriculum beyond that of the 'expected' standard. When assessing children in school, we have found that often children master the procedures and are fluent, but find applying the concepts more difficult.

A child working at 'exceeding' will be able to:

- access maths problems presented in a wide range of different, complex ways;
- be able to justify and prove their mathematical thinking when reasoning;
- Ask their own mathematical questions and follow their own lines of enquiry when exploring an open-ended maths problem.

One of the most important ways children can be supported is to encourage their reasoning about maths – can they explain why they think they have found the answer? Can they prove something is true or false? Can they say how things are similar/ different? Reasoning includes being able to explain verbally or in written form, using the correct mathematical vocabulary.

If a child is working at an 'exceeding' level in Maths they need to be able to complete most of the 'exceeding' statement this list and the 'expected 'statements will be embedded. If you have any concerns about your child's maths learning please book an appointment with their class teacher to discuss their maths level further.

Exceeding statements	How I can help at home…
Number and Place Value: **Demonstrate rapid recall of number facts and is able to use these fluently to generalise to obtain new facts using place value.** **Show very good understanding of place value and is able to apply this to working with larger numbers/decimals and in solving problems.** **Apply their understanding to solving increasingly complex problems, is able to reason and explain their thinking.**	Discuss numbers in everyday contexts, including larger numbers to at least 1 000 000 and decimals. Practice counting in multiples of 6, 7, 9, 11, 12, 25 and 1000, find 1000 more or less than a given number. Discuss the value of each digit in four, five, six and seven-digit numbers. Use thermometers and weather reports, also golf scores, to talk about negative numbers in context. Compare numbers – which is greater than/ less than? Estimate numbers – e.g. how many cornflakes are in the bowl? Practice rounding any number to the nearest 10, 100, 1000, 10 000 or 100 000. Encourage them to explain how they know using the correct language.
Addition and Subtraction: **Demonstrate rapid recall of number facts and is able to use these fluently to generalise to obtain new facts.** **Show a wide repertoire of reliable and efficient of calculation strategies, both written and mental, that they are able to apply when solving problems.** **Make choices regarding choice of strategies and explain reasoning.** **Solve problems of increasingly complexity using a range of strategies and is able to communicate their reasoning.** **Explain why different methods give the same result.** **Demonstrate creative thinking when problem solving and is able to justify and prove.**	Practice adding and subtracting numbers mentally to encourage fluency (include adding and subtracting larger numbers – up to five-digits). Encourage them to jot down their methods and talk about how they know they have the right answer. Practice adding and subtracting numbers with more than four digits, using formal written methods of column addition and subtraction. Encourage them to explain why they might need to carry for addition and borrow for subtraction. Using items around the house e.g. food packaging, numbers from newspapers, get children to make up word problems in context and solve them.
Multiplication and Division: **Demonstrate rapid and fluent recall of all x facts to 12 x 12 and is able to use their**	Practice multiplication and division facts for multiplication tables to 12 x 12 and beyond. Practice multiplying three-digit and four-digit numbers by a one or

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knowledge to generate new facts and when working with larger numbers. **Apply knowledge of factors, multiples, prime number, squares and communtativity to solving mental calculations of more complex problems.** **Show a clear understanding of the different structures of multiplication and division and the related vocabulary and is able to apply this to solving increasingly complex problems.** **Apply the knowledge of the inverse operation and the links between division and multiplication to solving problems.** **Demonstrate a wide repertoire of reliable and efficient of calculation strategies, both written and mental, that they are able to apply when solving problems.** **Solve problems of increasingly complexity using a range of strategies and is able to communicate their reasoning.**	two-digit number using a formal written method. Encourage them to jot down their methods and talk about how they know they have the right answer. Talk about what factors, multiples, prime numbers and square numbers are – try activities such as: find all the factors of 36 or 54; give 3 multiples of 4 greater than 24; give 3 prime numbers between 10 and 30; what are the square numbers to 12 x 12? Encourage them to use the inverse operations to check their calculations.
Fractions: **Apply knowledge of fractions to problems involving measures and shapes.** **Use their knowledge of decimals in problem involving measure to work with increased accuracy.** **Show very good understanding of the connections between fractions decimals and percentages and is able to use their knowledge to translate between the three.** **Apply their knowledge of fractions, decimals and percentages to problems of increasing complexity and to explain their reasoning and thinking.** **Apply links with division to solving increasingly complex problems**	Discuss fractions related to everyday situations e.g. eating dinners/ snacks – if you have eaten 2/5 of your snack how much do you have left? If I have 6 sweets and give away 3/4 how many have I given away/ got left? Include questions about lengths and shapes. Practice adding and subtracting fractions with the same denominator [for example, 5/7 + 1/7 = 6/7]. Practice converting fractions to percentages and decimals. Practice dividing one- or two-digit numbers by 10 and 100 and encourage them to explain the effect and identify the value of the digits in the answer as ones, tenths & 100ths. Practice rounding decimals with one decimal place to the nearest whole number. Encourage them to explain how they know and why they use the method they used.
Measures: **Apply knowledge of other areas of the curriculum to their understanding of and problem solving with measures. E.g. squares, cubes, fractions, multiplication decimals.** **Convert fluently and efficiently between different units of measures and be able to reason about the multiplicative relationship between related measures.** **Use their understanding of the concepts related to measures to solve increasingly complex problems.** **Communicate reasoning and talk about mathematics using sophisticated mathematical language.** **Apply knowledge of measures to other**	Cooking is one of the best ways to support measures – weighing ingredients and asking questions that encourage them to compare amounts. Look at packaging labels and ask questions such as: 'What is this amount in grams/ kilograms?' Practice converting mm to cm, cm to m, m to km, g to kg and vice versa etc. Relate to fractions and percentages by asking questions such as: 'What would be half/ quarter/ three quarters of this amount?' Encourage them to explain how they know and what did they did to convert one unit to another or to find half etc.

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areas of the curriculum such as science.	
Properties of Shapes: **Sort and classify shapes using a wide range of criterion using increasingly sophisticated mathematically appropriate vocabulary. Creatively apply knowledge of shapes to solving problems with increasing complexity and be able to justify reasoning and communicate their thinking. Make links and connections with other areas of the curriculum and be able to generalise their understanding.**	Talk about objects at home and what shapes they are – encourage them to explain how they know using correct vocabulary (a list is available if needed). Especially look at triangles and quadrilaterals. Encourage them to explain what is the same/ different about shapes. Discuss angles in shapes and the different types of angles. Encourage them to explain why an angle is acute/obtuse/right/reflex. Encourage them to compare the size of angles. Get them to find examples of horizontal and vertical lines and pairs of perpendicular and parallel lines around the house.
Position and Movement: **Solve increasingly complex problems involving position and movement. Apply knowledge and understanding of position and movement to other curriculum areas such as geography and science.**	Use maps to find places using coordinates. Play coordinate based games, such as, Battleships. Encourage them to describe movements of a point or shape on a map as translations of a given unit to the left/right and up/down. Look at reflections and discuss how objects do not change when reflected.
Statistics: **Use knowledge of data handling to pose hypothesis and answer questions through the analysis and interpretation of data. Draw conclusions based on data and be able to communicate reasoning. Be able to look for alternative explanations and hypothesis. Use understanding of statistics in other curriculum areas.**	Look at tables on food labels and discuss them. Ask comparison questions such as, how many grams of salt are there compared to carbohydrate etc. Encourage them to explain how they know. Look at examples of graphs in newspapers etc (including line graphs) and ask questions such as: How many more?' and 'How many fewer?' 'What do the ingredients show use about this type of food compared to this?' Encourage them to explain how they know.

Please do not feel compelled to complete all the suggestions all the time. Any support, however small, will help your child to make progress.