**7(3) NUMBER into ALGEBRA**

|  |  |
| --- | --- |
| **Title** | Algebraic Magic Squares |
| **Hours** | 1 (2) |
| **Aims** | * Simplifying Expressions * Writing Equivalent Expressions * Substitution |
| **Pedagogy** | * Fluency |
| **Activity**  **(details)** | Starter  Show pupils the magic square and ask them in their pairs then groups to decide why it is a magic square. Collect ideas from the groups to share with the class.  Main Activity  Show pupils the magic square with numbers in each box next to the magic square with expressions in each box. Explain to students that the two magic squares are the same. Ask them to use this information to work out the value of the x, the a and the b.  For task two explain that the values of x, a and b are going to stay the same as they did for task one but they must change each expression so that the magic number for the square is 30 instead of 15. Some pupils will recognise that they need to double the expressions in each box. This can lead into a discussion of how x + a doubled becomes x + x + a + a which is the same as 2x + 2a or 2(x + a). This tasks is differentiated by outcome, pupils requiring greater challenge should be encouraged to simplify their expressions and use brackets were possible.  *(Task A is a support task for pupils who need to consolidate their understanding how a magic square works.*  *Task 3 is an extension task, pupils need to create their own algebraic magic square and check that it works using substitution.)*  Plenary  Ask each group to share their ideas with the class. How many different expressions did pupils write to show x + x + a + a and so on.  Ask pupils what they can do to check that the square is a magic square. |
| **>H** | **Create a magic square using expressions, understand how to collect like terms and simplify to ensure that each sum of each row, column and diagonal is an equivalent expressions.** |
| **H** | Simplify expressions, understand the meaning of brackets in an expression, begin to factorise and expand simple expressions. |
| **M** | **Write equivalent expressions.** |
| **L** | **Substitute positive values into simple expressions.** |
| **<L** | Be able to find the magic total for a magic square containing numbers. |