The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Support – Place Value and Calculations

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to read and write numbers using place value.	• Students will know how to fill in a place value table with a range of integers and decimals. • Students will know how to read values from a place value table with a range of integers and decimals. • Students need to know how to read and write numbers of any size in words and digits.	**Place Value** – the value of a digit **Integer –** a whole number **Decimal –** a number whose number is separated by a decimal point			
To learn how to identify the value of a digit.	• Students will know how to identify the value of a digit within both large and small integers and decimals.	**Digit –** any of the numerals from 0 to 9.	• Students need to know how to fill in a place value table. • Students need to know how to write numbers in words.		
To learn how to order numbers.	• Students will know how to order positive integers. • Students will know how to order positive and negative integers. **Opportunity for challenge:** • Students will know how to order positive and negative integers in a real-life context.	**Order –** the arrangement according to a particular sequence, pattern, or method. **Ascending –** smallest to largest **Descending** – largest to smallest **Negative –** Less than zero	• Students need to know how to identify the value of a digit within both large and small integers.	**Steps to Success – Ordering Numbers** **Step 1:** Identify the first digit of each number and look at it's place value, the number with the greatest place value is biggest. **Step 2:** If the place value is the same, look at the size of the digit, If the digit is larger, then the number is larger. **Step 3:** If the value of the digits is the same, you go to the next digit to the right and compare the size of those digits. **Step 4:** Repeat until you have ordered all of the numbers	
To learn how to order decimals.	• Students will know how to order decimals.	**Decimal –** a number whose number is separated by a decimal point	• Students need to know how to identify the value of a digit within involving decimals.	**Steps to Success – Ordering Decimals** **Step 1:** Identify the first digit of each number and look at it's place value, the number with the greatest place value is biggest. **Step 2:** If the place value is the same, look at the size of the digit, If the digit is larger, then the number is larger. **Step 3:** If the value of the digits is the same, you go to the next digit to the right and compare the size of those digits. **Step 4:** Repeat until you have ordered all of the numbers	
To learn how to add integers.	• Students will know how to add 2-digit and 3-digit integers using column addition. • Students will know how to solve simple real-life problems using column addition.	Use a spider diagram to show different words which mean to add. E.g. sum	• Students need to know how to add single digit integers. • Students need to know how to align numbers according to place value.	Please use the link attached as it contains images representing the method. Column Addition Steps to Success	
To learn how to subtract integers.	• Students will know that addition and subtraction are inverse operations of one another. • Students will know how to subtract 2-digit and 3-digit integers using column subtraction. • Students will know how to solve simple real-life problems using column subtraction.	Use a spider diagram to show different words which mean to add. E.g. difference	• Students need to know how to subtract single digit integers. • Students need to know how to align numbers according to place value.	Please use the link attached as it contains images representing the method. Subtraction Steps to Success	

<table>
<tr><th>Lesson objective</th><th>Intended Knowledge:</th><th>Tiered Vocabulary</th><th>Prior Knowledge:</th><th>Steps to Success</th><th>Feedback</th></tr>
<tr><td>To learn how to add decimals.</td><td>• Students will know how to add decimals using column addition.
• Students will know how to solve simple real-life problems involving the addition of decimals.</td><td></td><td>• Students should already know how to add integers using column addition.</td><td><u>Adding decimals – steps to success</u>
Step 1: Write the second number in the question underneath the first number, making sure that you line up the decimal points and that digits that are in the same place value column are underneath one another.
Step 2: Fill in any gaps with a 0.
Step 3: Add together the two numbers using column addition.</td><td></td></tr>
<tr><td>To learn how to subtract decimals.</td><td>• Students will know how to subtract decimals using column subtraction.
• Students will know how to solve simple real-life problems involving the subtraction of decimals.</td><td></td><td>• Students should already know how to subtract integers using column subtraction.</td><td><u>Subtracting decimals – steps to success</u>
Step 1: Write the second number in the question underneath the first number, making sure that you line up the decimal points and that digits that are in the same place value column are underneath one another.
Step 2: Fill in any gaps with a 0.
Step 3: Subtract the two numbers using column subtraction.</td><td></td></tr>
<tr><td>To learn how to add and subtract negative numbers.</td><td>• Students will know how to add and subtract with negative numbers using a number line. E.g. $4-7$ or $-3+5$

Avoid using terminology such as 2 negatives make a positive.</td><td></td><td>• Students need to know how to order positive and negative numbers.
• Students need to know how to add and subtract positive integers.</td><td><u>Adding and Subtracting Negative Numbers</u>
Think of positive numbers as hot and negative numbers as cold.
Adding a negative number is like adding cold air to a room — it makes the room colder. So, the number goes down.
Subtracting a negative number is like removing cold air from a room — it makes the room warmer. So, the number goes up.</td><td></td></tr>
<tr><td>To learn how to multiply by powers of 10.</td><td>• Students will know how to multiply integers by 10, 100 and 1000.
• Students will know how to multiply decimals by 10, 100 and 1000.</td><td></td><td>• Students need to know how to fill in and use a place value table.</td><td><u>Steps to Success – Multiplying by Powers of 10</u>
Step 1: Draw out a place value table like the one below to help you.<table><tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th><th>.</th><th>Tenths</th><th>Hundredths</th><th>Thousandths</th></tr><tr><td></td><td></td><td></td><td></td><td>.</td><td></td><td></td><td></td></tr></table>Step 2: Align the digits of the number that you are multiplying by 10, 100 or 1000 etc. into the place value table
Step 3: Work out how many times you need to shift the digits to the left:
If you are multiplying by 10 shift all the digits 1 space to the left.
If you are multiplying by 100 shift all the digits 2 spaces to the left.
If you are multiplying by 1000 shift all the digits three spaces to the left and so on.
Step 4: Once you have shifted all digits the appropriate number of times you can then write this new number as your final answer.</td><td></td></tr>
<tr><td>To learn how to divide by powers of 10.</td><td>• Students will know how to divide integers by 10, 100 and 1000.
• Students will know how to divide decimals by 10, 100 and 1000.</td><td></td><td>• Students need to know how to fill in and use a place value table.</td><td>Steps to Success – Dividing by Powers of 10
Step 1: Draw out a place value table like the one below to help you.<table><tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th><th>.</th><th>Tenths</th><th>Hundredths</th><th>Thousandths</th></tr><tr><td></td><td></td><td></td><td></td><td>.</td><td></td><td></td><td></td></tr></table></td><td></td></tr>
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				Step 2: Align the digits of the number that you are multiplying by 10, 100 or 1000 etc. into the place value table **Step 3:** Work out how many times you need to shift the digits to the right: If you are dividing by 10 shift all the digits 1 space to the right. If you are dividing by 100 shift all the digits 2 spaces to the right. If you are dividing by 1000 shift all the digits three spaces to the right and so on. **Step 4:** Once you have shifted all digits the appropriate number of times you can then write this new number as your final answer.	
To learn how to multiply integers. Lesson 1	• Students will know how to multiply 2-digit integers by a 1-digit integer using column multiplication. • Students will know how to multiply 3-digit integers by a 1-digit integer using column multiplication.	Use a spider diagram to show different words which mean to multiply. E.g. product	• Students need to know how to multiply single digit integers. • Students need to know how to add integers using column addition.	**Steps to Success – Multiplying integers.** **Step 1:** To start, write the bigger number over the smaller one, making sure that the 1s are above each other, the 10s are above each other and so on. Keeping everything in the right column is very important. **Step 2:** Then, we want to multiply each **component** of the top number by the unit of the second number and write the results of the multiplications under the line. Make sure to carry over any digit that does not belong in that column. **Step 3:** Now, we do everything we just did but this time, multiply each component of the top number by the tens. The only **difference** is because for e.g. a 2 represents a 20, everything is shifted one space to the left and a zero is put in the 1s column. For the completed step, using same methods as before. **Step 4:** Finally, we add together the two sets of numbers and write the final answer underneath the second line.	
To learn how to multiply integers. Lesson 2	• Students will know how to multiply 2-digit integers by a 2-digit integer using column multiplication. • Students will know how to multiply 3-digit integers by a 2-digit integer using column multiplication.		• Students will know how to multiply 2-digit and 3-digit integers by a 1-digit integer using column multiplication. • Students need to know how to add integers using column addition.		
To learn how to divide integers.	• Students will know that multiplication and division are inverse operations of one another. • Students will know how to divide 2-digit and 3-digit integers by a 1-digit integer using short division. • Students will know how to divide 2-digit and 3-digit integers by a 1-digit integer giving decimal answers. **Opportunity for challenge** • Students will know how to divide 2-digit and 3-digit integers by a 2-digit integer using short division.	Use a spider diagram to show different words which mean to divide. E.g. share	• Students need to know how to calculate simple divisions by counting.	**Steps to Success – Dividing integers** Example: 288 ÷ 9 **Step 1:** Draw a rotated L-shape with the number we are dividing (the dividend) on the inside, and the number we're dividing by (the divisor) on the outside. **Step 2:** From there, we ask how many times 9 goes into 2 and write the answer, zero, above the line, as before. Then, we write the remainder of this division, 2, in the gap just before the next digit of the dividend. **Step 3:** We ask how many times the divisor goes into the number formed by that remainder and the next digit, which here	

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				is 28. So, 9 goes into 28 three times with a remainder of 1, meaning we write a 3 above the line and a 1 in the gap before the third digit of the dividend. **Step 4:** This process is the same and repeats until we get to the end of the number. **Step 5:** If the divisor does not fit perfectly into the divided, you can either stop once you get to the end and take the final remainder to be the remainder of the whole division, or you can put in a decimal point and keep going until you are satisfied with how many decimal points you have.	
Mini-Assessment 1					