The Sutton Academy

Knowledge Rich Curriculum Plan

Year 8 Prime – Fractions

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to add and subtract fractions.	• Students will know how to add fractions with different denominators. • Students will know how to subtract fractions with different denominators. • Students will know how to add mixed numbers. • Students will know how to subtract mixed numbers. • Students will know to write their answers in the simplest form when possible. • Students will know solve simple real-life problems involving adding and subtracting fractions. **Opportunity for challenge:** • Students will know how to solve multi-step/complex problems involving adding and subtracting fractions.	**Fraction –** a way of representing the parts of a whole **Denominator –** the bottom number in a fraction **Numerator –** the top number in a fraction **Improper Fraction –** a fraction where the numerator is larger than the denominator **Mixed Number –** a number consisting of an integer and a proper fraction.	• Students need to know how to simplify and find equivalent fractions • Students need to know how to convert between improper fractions and mixed numbers.	**Steps to Success – Adding and subtracting fractions** **Step 1:** In order to add and subtract fractions, you need both fractions to have a common denominator. There are two main methods for choosing a common denominator: • Use the lowest common multiple (LCM) of the two denominators. • Use the product of the two denominators. **Step 2:** Once you have chosen your common denominator you have to ensure you keep the fractions equivalent to the original fractions in the question. This means that whatever you have done to the denominator of the original fraction, you must also do to the numerator. **Step 3:** You can now just need to add or subtract the two numerators. The denominator stays the same. **Step 4:** Check whether your answer can be simplified and/or converted into a mixed number.	
To learn how to multiply and divide fractions.	• Students will know how to multiply fractions. • Students will know how to multiply integers by fractions. • Students will know how to multiply mixed numbers. • Students will know how to divide fractions. • Students will know how to divide integers by fractions. • Students will know how to divide fractions by integers. • Students will know how to divide mixed numbers. • Students will know to write their answers in the simplest form when possible. **Opportunity for challenge:** • Students will know solve real-life problems involving multiplying and dividing fractions.	**Reciprocal – The reciprocal of a number is 1 divided by the number**	• Students need to know how to simplify fractions. • Students need to know how to convert between improper fractions and mixed numbers.	**Steps to Success - Multiplying fractions** **Step 1:** Convert any mixed numbers into improper fractions and/or write any integers as a fraction over 1. **Step 2:** Multiply the numerators. **Step 3:** Multiply the denominators. **Step 4:** Check whether your answer can be simplified and/or converted into a mixed number. **Steps to Success - Dividing fractions** **Step 1:** Convert any mixed numbers into improper fractions and/or write any integers as a fraction over 1 **Step 2:** Keep the first fraction the same, change the divide into a multiply and find the reciprocal of the second fraction. **Step 3:** Multiply the numerators. **Step 4:** Multiply the denominators. **Step 5:** Check whether your answer can be simplified and/or converted into a mixed number.	
To learn how to find the fraction of a quantity and calculate fractions on a calculator.	• Students will know that to find the fraction of a quantity by dividing the quantity by the denominator and then multiplying the result by the numerator. • Students will know how to find the fraction of a quantity using simple fractions with numerators of 1. eg. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ • Students will know how to find the fraction of a quantity using fractions with numerators of more than 1. eg. $\frac{2}{3}$, $\frac{3}{4}$, $\frac{7}{10}$	**Quantity** - the amount or number of a material or abstract thing	• Students need to know how to input fractions and other basic operations on the calculator.	**Steps to Success – Fractions of an Amount** **Step 1:** Divide the quantity in the question by the denominator. **Step 2:** Now multiply the answer by the numerator. **Converting improper fractions to mixed numbers on a calculator:** Step 1: Type in the improper fraction Step 2: Press the equals sign	

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	• Students will know how to compare fractions of different quantities. • Students will know how to solve real-life problems using fractions of quantities. • Students will know how to use a calculator to simplify fractions. • Students will know that a calculator will always give a fractional answer in its simplest form. • Students will know how to convert improper fractions to mixed numbers using a calculator. • Students will know how to convert mixed numbers to improper fractions using a calculator. • Students will know how to use a calculator to add, subtract, multiple and divide fractions. • Students will know how to use a calculator to find a fraction of a quantity. • Students will know how to complete calculations with mixed numbers on a calculator.			Step 3: Press shift and then the S<>D button, this will convert your answer to a mixed number. **Converting mixed numbers to improper fractions on a calculator:** Step 1: Press shift and the fraction button Step 2: Type in the mixed number Step 3: Press the equals sign, this will give the improper fraction	
To learn how to convert between fractions, decimals and percentages.	• Students will know how to convert fractions to percentage and decimals with fractions such as $\frac{6}{25}$, $\frac{7}{10}$ and $\frac{3}{8}$. • Students will know how to convert decimals to percentages and fractions using decimals such as 0.45, 0.013 and 1.5. • Students will know how to convert decimals to fractions and percentages with percentages such as 34%, 127% and 42.3%. • Students will know how to convert between fractions, decimals and percentages with a calculator. • Students will know how to order a mixture fractions, decimals and percentages with and without a calculator. **Opportunity for challenge:** • Students will know how to solve real-life problems involving converting fractions, decimals and percentages.	**Convert –** change a value or expression from one form to another **Percentage** – a rate, number, or amount in each hundred. **Fraction –** a way of representing the parts of a whole or collection of objects. Fractions have a numerator and denominator. **Decimal –** a number whose whole number part and the fractional part is separated by a decimal point	• Students need to know how to multiply and divide by powers of 10. • Students need to know how to find equivalent fractions. • Students need to know basic fraction, decimal and percentage conversions such as $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$.	**Steps to Success – Converting fractions to decimals** **Step 1:** When possible find an equivalent fraction with a denominator of 100 or 10. If this is not possible then go straight to step 2. **Step 2:** Divide the numerator by the denominator using short division if necessary. **Steps to Success – Converting fractions to percentages** **Step 1:** When possible find an equivalent fraction with a denominator of 100 – you can then write your percentage straight away as all percentages are out of 100. If this is not possible then go straight to step 2. **Step 2:** Divide the numerator by the denominator using short division if necessary. This will give you a decimal. **Step 3:** Convert the decimal into a percentage by multiplying it by 100. **Steps to Success – Converting decimals to fractions** **Step 1:** Multiply the decimal by powers of 10 to gain an integer value. **Step 2:** Place the power of 10 used as the denominator. **Steps to Success – Converting decimals to percentages** **Step 1:** All percentage are out of 100. So, multiply the decimal by 100 to turn it into a percentage.	

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				Steps to Success – Converting percentages to decimals **Step 1:** All percentages are out of 100. So, divide the percentage by 100 to turn it into a decimal. **Steps to Success – Converting percentages to fractions** **Step 1:** All percentage are out of a hundred. So, rewrite the percentage as a fraction. **Step 2:** You may need to multiply the numerator and denominator by powers of 10 to ensure the numerator is an integer. **Step 3:** Check to see if the question asks for the fraction in its simplest form. If so, simplify the fraction.	
To learn how to convert between recurring decimals and fractions.	• Students will know that recurring decimals are irrational decimal numbers that repeat periodically. • Students will know how to convert fractions to recurring decimals using division. • Students will know how to convert recurring decimals to fractions using the algebraic method.	**Recurring** - occurring again periodically or repeatedly	• Students need to know how to convert between fractions and decimals. • Students need to know how to simplify fractions.	**Steps to Success - How do we convert recurring decimals to fractions?** **Step 1:** Let x equal the recurring decimal written out to several decimal places **Step 2:** Multiply x by the appropriate power of ten – (if only one digit recurs then multiply by 10, if two digits recur then multiply by 100, if three digits recur then multiply by 1000 and so on) **Step 3:** Rewrite this as 10x/100x/1000x = the recurring decimal multiplied by that power of 10 **Step 4:** Set up column subtraction **Step 5:** Subtract x from 10x/100x/1000x **Step 6:** Divide by the coefficient of x to find the fraction equivalent for the recurring decimal	
To consolidate understanding of fractions and FDP	• Students will know how to identify the type of calculation they are completing with fractions. • Students will be able to complete calculations with fractions including the four operations. • Students will know how to convert FDP		Students will know how to simplify fractions and convert fractions.	Use steps from previous lessons.	
Mini-Assessment 3					