Y6 Maths What they need to know...

This half term we will be doing some work on **fractions**, with the following learning goals as our guide:

- To compare and order fractions, including fractions >1.
- To use common factors to simplify fractions, and common multiples to express fractions in the same denomination.
- To add and subtract fractions with different denominators, using the concept of equivalent fractions.
- To associate a fraction with division to calculate decimal fraction equivalents (0.375) for a simple fraction (3/8).
- To multiply simple pairs of proper fractions, writing the answer in its simplest form (1/4 x 1/2 = 1/8).
- To divide proper fractions by whole numbers (1/3 ÷ 2 = 1/6).

Activities & Games:

⋆ Ordering Fractions

Can you order the following fractions from smallest to largest? You might need to find a common denominator!

3/4—5/9—1/2— 11/18—2/6— 2/3—7/12—20/36 —45/72

Now order these from largest to smallest…..

4/6—5/8—2/3—11/12—3/4—15/24—10/48

⋆⋆ Chocolate

This challenge is about chocolate. You have to imagine (if necessary!) that everyone involved in this challenge enjoys chocolate and wants to have as much as possible. There's a room in your school that has three tables in it with plenty of space for chairs to go round. Table 1 has one block of chocolate on it, table 2 has two blocks of chocolate on it and, guess what, table 3 has three blocks of chocolate on it. Now imagine there are 18 children outside waiting to come in to share the chocolate. Could you arrange them around the tables so they all get the same amount of chocolate to enjoy? The blocks can be broken up into smaller parts to share out.

⋆⋆⋆ Fraction Subtraction

Have a go at these subtraction questions. Remember that you might need to find a common denominator to help solve them!

1. $2\frac{3}{5} - 1\frac{1}{5} =$ ________
2. $1\frac{4}{9} - \frac{8}{9} =$ ________
3. $5\frac{5}{8} - 1\frac{9}{16} =$ ________
4. $12 - 4\frac{5}{6} =$ ________
5. $6\frac{15}{16} - 4 =$ ________
6. $3\frac{7}{12} - 2\frac{3}{4} =$ ________
7. $9 - 7\frac{5}{8} =$ ________
8. $15\frac{1}{6} - 8\frac{2}{3} =$ ________
9. $6\frac{8}{9} - 1\frac{2}{3} =$ ________
10. $2\frac{3}{7} - 1\frac{5}{14} =$ ________

Going deeper...

The Greedy Algorithm

You may be aware that the Ancient Egyptians expressed fractions as the sum of different unit fractions. A unit fraction is a fraction with a 1 as its numerator. For example, 3/4 (a non unit fraction) would be written as 1/4 + 1/4 + 1/4. But how would the Egyptians have coped with fractions with large numerators such as 115/137 ? They might have written 115/137=1/137 + 1/137+ 1/137+…..but this would have taken a very long time. Fibonacci found an alternative strategy, called the Greedy Algorithm:

At every stage, write down the largest possible unit fraction that is smaller than the fraction you're working on.

For example, let's start with 11 / 12 :
The largest possible unit fraction that is smaller than 11/12 is 1/2

11/12 − 1/2= 5/12
So 11/12 = 1/2 + 5/12
The largest possible unit fraction that is smaller than 5/12 is 1/3
5/12 − 1/3 = 1/12
So 11/12 = 1/2 + 1/3 + 1/12

Choose a fraction of your own and apply the Greedy Algorithm to see if you can finish up with a string of unit fractions. Does the greedy algorithm always work?

Wonderful websites

Multiplying and Dividing

Fractions

Have a look at the 'Maths is Fun' website to learn about how to solve problems involving mixed numbers and division.

Whilst it can be very tempting to encourage your child to have a go at the more challenging activities, it is far better to work with them at a level they feel confident with. Significant and regular practise of even the most basic skills outlined in this document will lead to a much deeper understanding and greater proficiency, and ultimately a much more pleasant 'homework' experience for you and your child!