Lesson 2

Year 6, Primary 6, Mathematics
Vulgar Fractions

Be Wizard At Maths

I don't usually make jokes about fractions...
...but I will make one if I halve two.

2.1 Lowest Common Multiple

The multiples of 6 are the numbers that are in the 6 times table.

$$1 \times 6 = 6$$
$$2 \times 6 = 12$$
$$3 \times 6 = 18$$
$$4 \times 6 = 24$$
$$5 \times 6 = 30$$
$$6 \times 6 = 42$$
$$7 \times 6 = 48$$
$$\ldots \times \ldots = \ldots$$

{Multiples of 6} = { 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, ... }

The multiples of 15 are the numbers that are in the 15 times table.

$$1 \times 15 = 15$$
$$2 \times 15 = 30$$
$$3 \times 15 = 45$$
$$\ldots \times \ldots = \ldots$$

{Multiples of 15} = {15, 30, 45, ...}

The ***lowest common multiple*** of 6 and 15 is the first integer that is in the 6 times table and also in the 15 times table

$$lcm\ \{6,15\} = 30$$

This is the key to adding awkward fractions which have awkward denominators.

For example, $\frac{1}{6} + \frac{4}{15}$

The trick is to work out the ***lowest common multiple*** of the denominators and then use the multiplying by 1 technique on ***both*** pieces of the fraction sum.

$$\frac{1}{6} + \frac{4}{15} = \frac{1}{6} \times \mathbf{1} + \frac{4}{15} \times \mathbf{1} \qquad \text{Step 1: Multiply by 1}$$

$$= \frac{1}{6} \times \frac{\mathbf{5}}{\mathbf{5}} + \frac{4}{15} \times \frac{\mathbf{2}}{\mathbf{2}} \qquad \text{Step 2: Use } lcm\{6,15\} \text{ is 30}$$

$$= \frac{5}{30} + \frac{8}{30} \qquad \text{Step 3: Do the two multiplications}$$

$$= \frac{13}{30} \qquad \text{Step 4: Do the easy addition}$$

The ***lowest common multiple*** when used in this way is often called the ***lowest common denominator***

2.2 Exercise

Marks Available : 40

Question 1

(i) List the first six multiples of 8

[1 mark]

(ii) List the first six multiples of 12

[1 mark]

(iii) What is $lcm\{8,12\}$?

[1 mark]

(iv) Showing all the steps, work out $\frac{3}{8} + \frac{5}{12}$

[7 marks]

Question 2

(i) List the first six multiples of 10

[1 mark]

(ii) List the first six multiples of 25

[1 mark]

(iii) What is $lcm\{10,25\}$?

[1 mark]

(iv) Showing all the steps, work out $\frac{3}{10} + \frac{7}{25}$

[7 marks]

Question 3

(i) List the first ten multiples of 9

[1 mark]

(ii) List the first six multiples of 24

[1 mark]

(iii) What is $lcm\{9,24\}$?

[1 mark]

(iv) Showing all the steps, work out $\frac{2}{9} + \frac{7}{24}$

[7 marks]

Question 4

(i) List the first eight multiples of 12

[1 mark]

(ii) List the first eight multiples of 14

[1 mark]

(iii) What is *lcm*{12,14} ?

[1 mark]

(iv) Showing all the steps, work out $\frac{5}{12} - \frac{1}{14}$

[7 marks]