Chapter 15 - Fractions and Ratios

Comparing fractions 7 minutes and 37 seconds

Comparing two fractions to decide which is the larger and which is the smaller can be quite tricky, we use the idea of equivalent fractions and the idea of common denominator so looking at two fifths and a half to compare those, we would look for a denominator which is common to fifths and halves. A number which is a common multiple of those two denominators. Well clearly, that's going to be ten. So we change each of these into tenths. How many tenths is two fifths? That's four tenths. How many tenths is half? That's five tenths, clearly now four tenths is less than five tenths so we've decided there that the two fifths is less than the half.

Let's take another example, seven eighths and five sixths. Not immediately obvious which is the larger of those is it? Well, we will look for a common multiple of the two denominators-eight and six. To do that I'm going to go through the eight times table until I come to a multiple of eight that is also in the six times table. Eight, sixteen, twenty-four-that's it. Twenty-four is a multiple of six. So I'll change both these fractions into twenty fourths, here we go, how many twenty-fourths will that be? And how many will that be? Let's have a look. Well one eighth is three twenty-fourths so seven eights, seven threes are twenty-one that will be twenty-one twenty fourths. One sixth that's four twenty fourths, four fives are twenty so this will give us twenty twenty-fourths there. We can now see which is the greater, twenty one greater than twenty and so we have decided here that seven eights is greater than five sixths.

Now here I have four fractions, three quarters, five sixths, two thirds and five eighths and I want to decide which of these is the smallest, which is the largest, put them in order from smallest to largest to do that, I need a common denominator for four, six three and eight and then I shall change these into equivalent fractions with that common denominator. So once again, I go through the multiples of eight until I come to one which is a multiple of six and four and three. Here we go, eight no, sixteen, no that's not a multiple of three. Twenty-four, yes that's a multiple of three and six and four so

we would change each of these fractions into an equivalent number of twenty-fourths. That's the lowest common denominator for these four fractions.

How many twenty-fourths do we have? Well three-quarters, let's do that, one quarter is six twenty-fourths so three quarters, three times six-eighteen. Five sixths, one sixth is four twenty-fourths, five sixths, five times four, twenty twenty-fourths. Two thirds, well one third is eight twenty-fourths. Two thirds will be sixteen twenty-fourths and five eights, well one eighth is three twenty-fourths, five threes are fifteen so that's fifteen twenty-fourths altogether. Now we can see how they compare because they're all expressed as twenty-fourths. Fifteen twenty-fourths is the smallest, that's five eighths so we put that at the left hand end of our row. That's less than the next one which is sixteen twenty-fourths that's two thirds which is less than the next one which is eighteen twenty-fourths that's err…three quarters and that's less than the largest one five sixths. So there we've put the four fractions in order from smallest to largest.

Now I just want to show you those four fractions we've put in order and give you a pictorial image of what we've just been doing. Let's consider this to be one unit, one whole unit we can divide that up into twenty-four equal parts. There they are and I'm going to number them from one to twenty-four. The fraction five eights because one eighth of this unit is three of those twenty fourths, five eights is fifteen of them. Fraction two thirds a third of twenty-four is eight so two-thirds of this unit is going to take us up as far as sixteen twenty-fourths. That's a little bit bigger than five eighths, five sixths, one sixth of twenty-four is four, so five sixths will take us up to twenty twenty-fourths. That's by far the largest of the fractions so far and then finally, we have three quarters well a quarter of the way along this unit takes us up to six, three quarters of the way along would take us up to uhh…three sixes are eighteen. There's three quarters of the unit and we can see clearly from the picture there that five sixths is the largest. Three quarters is the next, two thirds is the next and five eighths is the smallest.