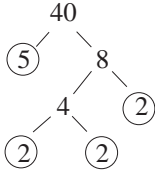
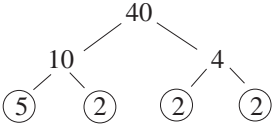
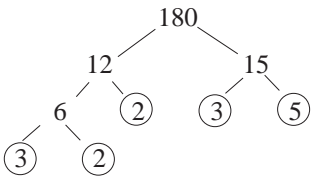


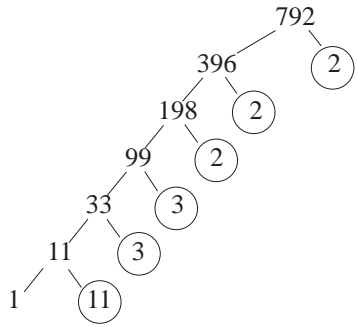
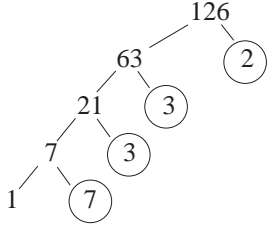
<p>Y8</p>	<p>UNIT 2 <i>Factors</i> Lesson Plan 2</p>	<p><i>Factors and Prime Numbers</i></p>																		
<p>Activity</p> <p>1</p>	<p>Checking homework</p> <p>PB 2.3, Q2 (e) - (i) (e) 128 (f) 81 (g) 81 (h) 1000 (i) 10 000 000</p> <p>PB 2.3, Q3 (c), (d), (f) (c) 3^4 (d) 2^4 (f) 7^4</p> <p>PB 2.3, Q4 (d) - (f) (d) 72 (e) 243 (f) 1000</p> <p>PB 2.3, Q5 (a) 2^8 (b) 5^9 (c) 6^6 (d) 7^{10} (e) 8^7</p> <p style="text-align: right;">7 mins</p>	<p>Notes</p> <p>T asks a P to write solutions on BB as soon as P arrives.</p> <p>Discussion if necessary.</p> <p>Agreement, feedback, self-correction. Praising.</p>																		
<p>2</p>	<p>Revision of work with powers</p> <p>T: Work out the solutions to these calculations and then write them as powers. You can use a calculator if necessary.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="padding: 5px;">(1) $3^4 \div 3^2 = ? = 3^?$</td> <td style="padding: 5px;">$81 \div 9 = 9 = 3^2$</td> </tr> <tr> <td style="padding: 5px;">$2^5 \div 2^2 = ? = 2^?$</td> <td style="padding: 5px;">$32 \div 4 = 8 = 2^3$</td> </tr> <tr> <td style="padding: 5px;">$4^7 \div 4^4 = ? = 4^?$</td> <td style="padding: 5px;">$16384 \div 256 = 64 = 4^3$</td> </tr> <tr> <td style="padding: 5px;">(2) $2^3 \times 5^3 = ? = 10^?$</td> <td style="padding: 5px;">$8 \times 125 = 1000 = 10^3$</td> </tr> <tr> <td style="padding: 5px;">$2^4 \times 3^4 = ? = 6^?$</td> <td style="padding: 5px;">$16 \times 81 = 1296 = 6^4$</td> </tr> <tr> <td style="padding: 5px;">$5^2 \times 4^2 = ? = 20^?$</td> <td style="padding: 5px;">$25 \times 16 = 400 = 20^2$</td> </tr> <tr> <td style="padding: 5px;">(3) $6^3 \div 2^3 = ? = 3^?$</td> <td style="padding: 5px;">$216 \div 8 = 27 = 3^3$</td> </tr> <tr> <td style="padding: 5px;">$10^4 \div 5^4 = ? = 2^?$</td> <td style="padding: 5px;">$10\,000 \div 625 = 16 = 2^4$</td> </tr> <tr> <td style="padding: 5px;">$8^2 \div 2^2 = ? = 4^?$</td> <td style="padding: 5px;">$64 \div 4 = 16 = 4^2$</td> </tr> </tbody> </table> <p>T: What do you notice about the calculations in (1) ? <i>(When dividing a power by another power with the same base number, the result will be a power with the same base number, and its index will be the difference of the indices of the dividend and the divisor)</i></p> <p style="text-align: right;">16 mins</p>	(1) $3^4 \div 3^2 = ? = 3^?$	$81 \div 9 = 9 = 3^2$	$2^5 \div 2^2 = ? = 2^?$	$32 \div 4 = 8 = 2^3$	$4^7 \div 4^4 = ? = 4^?$	$16384 \div 256 = 64 = 4^3$	(2) $2^3 \times 5^3 = ? = 10^?$	$8 \times 125 = 1000 = 10^3$	$2^4 \times 3^4 = ? = 6^?$	$16 \times 81 = 1296 = 6^4$	$5^2 \times 4^2 = ? = 20^?$	$25 \times 16 = 400 = 20^2$	(3) $6^3 \div 2^3 = ? = 3^?$	$216 \div 8 = 27 = 3^3$	$10^4 \div 5^4 = ? = 2^?$	$10\,000 \div 625 = 16 = 2^4$	$8^2 \div 2^2 = ? = 4^?$	$64 \div 4 = 16 = 4^2$	<p>Individual work, monitored, helped.</p> <p>Task appears on OHP. In this warming-up activity Ps revise the meaning of a^n, using a calculator to count powers and also undertake further work with powers. Stronger Ps should be encouraged to draw up the rules (not compulsory!)</p> <p>T helps volunteer P with the wording.</p> <p>Praising.</p>
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<p>3</p> <p>Divisibility</p> <p>T: Today we're going to deal with divisibility.</p> <p>Can you share</p> <p>(a) 64 sweets</p> <p>(b) 74 sweets</p> <p>equally between 4 brothers?</p> <p>P₁: $64 \div 4 = 16 \rightarrow$ yes, they can be shared out equally.</p> <p>P₂: $74 \div 4 = 18 \text{ r}2 \rightarrow$ it's not possible to share them out equally.</p> <p>T: We say that 4 is a factor of 64, but is not a factor of 74.</p> <p><i>A factor divides exactly into a number leaving no remainder.</i></p> <p><i>(continued)</i></p>	<p>Whole class activity.</p> <p>Volunteer Ps answer, T agrees, writes answers on BB.</p> <p>T then introduces the notion of 'factor', and gives the definition.</p>																			

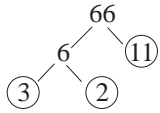
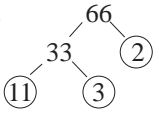
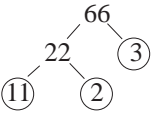
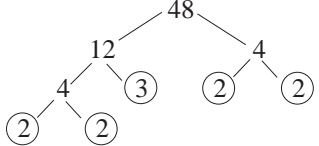
<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 2</p>	<p><i>Factors and Prime Numbers</i></p>
<p>Activity</p> <p>5A (continued)</p> <p>5B</p>	<p>T (after testing 10 as divisor): Do we need to look at more numbers? T: A prime number is one that can be divided only by itself and the number 1.</p> <p>Finding prime numbers</p> <p>T: List all the factors of each of the following numbers. Decide which are prime numbers.</p> <p>21, 23, 28</p> <p>P₁: 21 = 1 × 21 = 3 × 7 → 1, 3, 7, 21</p> <p>P₂: 23 = 1 × 23 → prime number</p> <p>P₃: 28 = 1 × 28 = 2 × 14 = 4 × 7 → 1, 2, 4, 7, 14, 28</p> <p style="text-align: right;">36 mins</p>	<p>Notes</p> <p>Then T defines prime numbers.</p> <p>Whole class activity. T might suggest that Ps look for pairs of factors. Ps volunteer and write factors on BB.</p> <p>Agreement. Praising</p>
<p>6</p>	<p>Individual practice PB 2.1, Q1 (numbers 16 - 20 only)</p> <p style="text-align: right;"><i>(Factors of 16 are 1, 2, 4, 8, 16</i></p> <p style="text-align: right;"><i>17 1, 17</i></p> <p style="text-align: right;"><i>18 1, 2, 3, 6, 9, 18</i></p> <p style="text-align: right;"><i>19 1, 19</i></p> <p style="text-align: right;"><i>20 1, 2, 4, 5, 10, 20)</i></p> <p style="text-align: right;">41 mins</p>	<p>Individual work, monitored, helped.</p> <p>Agreement, feedback, self-correction. Praising.</p>
<p>7</p>	<p>Whole class practice PB 2.1, Q5</p> <p>P₁: 40 = 1 × 40 = 2 × 20 = 4 × 10 = 5 × 8 → prime factors: 2, 5</p> <p>T: What about the number 1? It is also a prime factor, isn't it?</p> <p>P₁: The number one has only one factor, itself. A prime number has exactly <i>two</i> factors.</p> <p>T: Right.</p> <p>P₂: 70 = 1 × 70 = 2 × 35 = 5 × 14 = 7 × 10 → prime factors: 2, 5, 7</p> <p>T: So what will be the answer to part (c)?</p> <p>P₃: 40 and 70 have two prime numbers in common, 2 and 5.</p> <p style="text-align: right;">45 mins</p>	<p>Whole class activity.</p> <p>During this activity, T makes Ps give the definitions of 'factor' and 'prime number' again - care with precise and orderly spoken mathematics. Volunteer Ps come to BB, write factor pairs, choose the prime factors.</p> <p>Other Ps agree/correct, write in Ex.Bs.</p> <p>Praising.</p>
	<p>Set homework</p> <p>(1) List all the prime numbers up to 20.</p> <p>(2) PB 2.1, Q3</p> <p>(3) PB 2.1, Q6</p> <p>(4) PB 2.1, Q7</p>	

Y8	UNIT 2 <i>Factors</i> Lesson Plan 3	<i>Prime Factors</i>
<p>Activity</p> <p>1</p>	<p>Checking homework - Part 1</p> <p>(1) List all the prime numbers up to 20.</p> <p>T: Which is the first prime number? P₁: 2 T: The second one? P₂: 3 T: The next one? P₃: 5 (etc. up to 19) (2, 3, 5, 7, 13, 17, 19)</p> <p>(2) PB 2.1, Q3</p> <p>T: What do you know about the number 33 ? P₁: It's divisible by, for example, 3. T: 35 ? P₂: Divisible by 5. T: What about 37 ? P₃: This is a prime number. T: How many numbers did you try before coming to that decision? ... What was the largest number you tried? ... T: Let's look at the number 36, for example. Find its factors. (Think in pairs.)</p> <p>Ps (dictate, T writes):</p> 1×36 2×18 3×12 4×9 6×6 <p>T: Why don't we need to continue? <i>(From now on the factors would be repeated)</i></p> <p>T: So let's look at the number 23. How far do we have to go testing the factors? <i>(The last one we need to test is the 5, since $5 \times 5 > 23$. If there is no factor up to 5, there won't be one after that)</i></p> <p>T: Do we have to test 5 ? <i>(No)</i></p> <p>T: What about the 37 ? ... What is the last number we have to test? ... <i>(5, since $7 \times 7 = 49 > 39$)</i></p> <p>T: Why don't you test number 6 ? <i>(Because neither 2 nor 3 were factors)</i></p> <p>T: What else haven't you tested? <i>(The number 4)</i></p> <p>T: Why? <i>(If the number 2 was not a factor, its multiples will not be either)</i></p> <p>T: What do you notice? Which are the only numbers we have to test when we have no factors? <i>(The prime numbers)</i></p> <p>T: That's why they're so important.</p> <p style="text-align: right;">8 mins</p>	<p>Notes</p> <p>T points to Ps, one after another, and they continue the sequence of prime numbers. T agrees/waits for correction.</p> <p>Whole class activity involving detailed discussion. T leads Ps to make discoveries through interactive discussion. T praises whenever appropriate.</p>

<p>Y8</p>	<p>UNIT 2 <i>Factors</i> Lesson Plan 3</p>	<p><i>Prime Factors</i></p>
<p><i>Activity</i></p> <p>2</p>	<p>Finding prime numbers Activity 2.1 T: Let's look at a method for finding prime numbers.</p> <p style="text-align: right;"><i>16 mins</i></p>	<p style="text-align: center;">Notes</p> <p>Ps work in pairs with a copy of Activity 2.1; monitored, helped by T. T encourages stronger Ps to answer the questions in the Extension after they have completed the first 5 questions. Verbal checking: T points to Ps, one after another, to say the prime numbers in order up to 100. Correction if necessary. Then stronger Ps explain their answers to Q1 and Q2 of the Extension. Agreement. Praising.</p>
<p>3</p>	<p>Checking homework - Part 2 (3) PB 2.1, Q6 Ps: Since $7 \times 7 > 48$, we only need to look for factor pairs up to 6. And if the number 2 were not a factor of 48, we would not have to test 4 and 6 but 3 and 5.</p> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;"> $48 = 1 \times 48$ $2 \times 24 \rightarrow$ prime factor $3 \times 16 \rightarrow$ prime factor 4×12 6×8 </p> </div> <p style="text-align: center;">And the numbers 2 and 3 are also factors of 54.</p> <p>(4) PB 2.1, Q7 P: $2 \times 5 \times 7 = 70$</p> <p style="text-align: right;"><i>20 mins</i></p>	<p>For Q6, Ps discuss how they found the common factors. Then T asks how they would find them now, after having learnt new methods during this lesson.</p> <p>P writes on BB.</p> <p>Praising.</p> <p>For Q7, discussion if needed. Agreement, feedback, self-correction. Praising.</p>
<p>4A</p> <p><i>(continued)</i></p>	<p>Further work with prime numbers \rightarrow factor trees T: As you have seen, a number which is not a prime number, can be split into two numbers in different ways. After this splitting, one (or both) of the factors can be split again, and so on. Now we're going to split numbers down until we get prime numbers. T: We'll start with the number 48, and look at the second splitting, $48 = 2 \times 24$. Which of the factors can be split again? P₁: $24 = 6 \times 4$ T: And now? P₂: $6 = 3 \times 2$ and ... T (to a third P): And? P₃: ... and $4 = 2 \times 2$ T: Is that the end? P₄: Yes, that's the end. T: Could we have done this using another method? P₅: $24 = 8 \times 3$</p>	<p>Whole class activity. T has left the homework checking on BB so it can be referred to now. Then T points to Ps to continue splitting.</p>

<p>Y8</p>	<p>UNIT 2 Factors</p>	<p>Lesson Plan 3</p>	<p><i>Prime Factors</i></p>
<p>Activity</p> <p>4A (continued)</p> <p>4B</p>	<p>T: Then?</p> <p>P₆: $8 = 4 \times 2$</p> <p>P₇: $4 = 2 \times 2$</p> <p>T: What prime numbers do we have?</p> <p>Ps 2 and 3</p> <p>T: How many when we use the first method, and how many with the second?</p> <p>T (writes, Ps dictate):</p> $48 = 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3$ <p>T: Did you find that difficult to do in your head? We can also write it down, or draw it.</p> <p>OS 2.4</p> <p style="text-align: right;">28 mins</p>	<p>Notes</p> <p>T and Ps agree that the two ways led to the same numbers: one 'three' and four 'twos'. Finally they write down 48 with these numbers.</p> <p>Whole class activity. Task appears on OHP. T introduces factor trees and calls volunteer Ps to fill in the gaps. (Stresses that only prime numbers can be circled.) Agreement. Praising. Finally T introduces the expression 'product of its prime factors'.</p>	
<p>5</p>	<p>Practice with factor trees</p> <p>PB 2.2, Q2 (plus: 'Write 40 as the product of its prime factors.')</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>and</p>  </div> </div> <p>$40 = 2 \times 2 \times 2 \times 5 = 2^3 \times 5$</p> <p>PB 2.2, Q5 (plus: 'Write down the number as the product of its prime factors.')</p> <div style="text-align: center;">  </div> <p>$180 = 2 \times 2 \times 3 \times 3 \times 5 = 2^2 \times 3^2 \times 5$</p> <p style="text-align: right;">36 mins</p>	<p>Individual work, monitored, helped.</p> <p>Checking of Q2 at BB: volunteer Ps draw as many factor trees (one after another) on BB as there are in their Ex.Bs. Finally one of them writes the number as the product of its prime factors on BB.</p> <p>Verbal checking of Q5. Agreement, feedback, self-correction. Praising.</p>	
<p>6 (continued)</p>	<p>Finding prime factors by another method</p> <p>T: There is a special way to split a number into its prime factors by separating out the possible prime numbers at each step. We divide the number by 2 until the last digit becomes an odd number. Then we use the divisibility rule of 3 until the last number becomes a prime number, and so on.</p>	<p>Whole class activity.</p>	

<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 3</p>	<p><i>Prime Factors</i></p>
<p>Activity</p> <p>6 (continued)</p>	<p>T: For an example, let's look at the number 792.</p> <p>P₁: Its last digit is even, so the first factor is the number 2. $792 \div 2 = \dots$ (P writes this in Ex.B or makes a mental note; T waits for the quotient, then agrees or not and draws the factor 'tree', adding to it after each answer.) $\dots = 396$.</p>  <p>T: Read out 792 as the product of its prime factors. Ps: $792 = 2^3 \times 3^2 \times 11$</p> <p>T: Who would like to split the number 126 using this method?</p>  <p>T: Now read out 126 as the product of its prime factors. P: $126 = 2 \times 3^2 \times 7$</p> <p style="text-align: right;">41 mins</p>	<p>Notes</p> <p>T waits for Ps to give the next divisor (agrees or not) and the quotient. T writes on BB as Ps give correct numbers.</p> <p>A volunteer P explains and writes the 'new method' on BB.</p> <p>P at BB says the equation. Agreement. Praising.</p>
<p>7</p>	<p>Practice finding prime factors</p> <p>PB 2.2, Q7 (a), (e), (f)</p> <p>(a) 2×31 (e) $2 \times 3^2 \times 5$ (f) $2^3 \times 3 \times 5$</p> <p style="text-align: right;">45 mins</p>	<p>Individual work, monitored, helped. Checking with explanations by Ps at BB. Agreement, feedback, self-correction. Praising.</p>
	<p>Set homework</p> <p>PB 2.2, Q3 PB 2.2, Q4 PB 2.2, Q7 (b), (c), (g), (i)</p>	

<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 4</p>	<p><i>Highest Common Factor (HCF)</i></p>
<p>Activity</p> <p>1</p>	<p>Checking homework</p> <p>PB 2.2, Q3</p> <p>(a) For example,</p>  <p style="margin-left: 150px;">and</p>  <p style="margin-left: 150px;">(b) For example,</p>  <p>PB 2.2, Q4</p>  <p>PB 2.2, Q7 (b) 2^6 (c) 2×41 (g) 2×3^3 (i) $2^3 \times 5^3$</p> <p style="text-align: right;"><i>5 mins</i></p>	<p>Notes</p> <p>T has asked 3 Ps to write solution of homework exercises on BB (one task each) as soon as Ps arrive.</p> <p>Ps can now check/correct the work on BB; T agrees or not.</p> <p>For Q7, only the products in prime factors were asked for, but T can ask Ps who got other products to draw their factor trees on BB.</p> <p>Self-correction, Praising.</p>
<p>2</p> <p>Revision of fractions and simplest form</p> <p>T: Can you remember fractions?</p> <p>What do we mean when we write $\frac{6}{8}$?</p> <p style="text-align: center;"><i>(The unit is divided into eight equal parts and we have 6 of them)</i></p> <p>T: Can you give me another meaning?</p> <p style="text-align: center;"><i>($\frac{6}{8}$ can also mean that we have divided 6 units into 8 equal parts and are referring to one of the parts)</i></p> <p>T: In how many ways can we write this fraction?</p> <p style="text-align: right;"><i>(Many other ways)</i></p> <p>T: What do we need to remember when writing fractions in several different forms?</p> <p style="text-align: center;"><i>(The value of a fraction stays the same if we multiply or divide both its numerator and denominator by the same non-zero number)</i></p> <p>T: Give me some other forms of $\frac{6}{8}$. (e.g. $\frac{12}{16}$, $\frac{3}{4}$, $\frac{60}{80}$, $\frac{30}{40}$)</p> <p>T: Which of these do we call the simplest form of $\frac{6}{8}$? ($\frac{3}{4}$)</p> <p>T: Give me the simplest form of each of these fractions, and also say how you found it.</p> <p>T: $\frac{2}{8}$ Ps: $\frac{1}{4}$; I divided both its numerator and denominator by 2.</p> <p style="margin-left: 100px;">$\frac{6}{9}$ $\frac{2}{3}$; I divided both its numerator and denominator by 3.</p> <p style="margin-left: 100px;">$\frac{15}{10}$ $\frac{3}{2}$; by 5</p> <p><i>(continued)</i></p>	<p>Whole class activity.</p> <p>A short review of fractions (meaning, writing in different forms) to introduces HCF as a possible solution for writing a fraction in its simplest form.</p> <p>Mental work.</p> <p>T asks, volunteer Ps answer.</p>	

<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 4</p>	<p><i>Highest Common Factor (HCF)</i></p>
<p>Activity</p> <p>2 <i>(continued)</i></p>	<p>$\frac{30}{50}$ Ps: $\frac{3}{5}$; ... by 10.</p> <p>$\frac{7}{14}$ $\frac{1}{2}$; ... by 7</p> <p>$\frac{80}{60}$ $\frac{4}{3}$; ... by 20</p> <p>$\frac{400}{500}$ $\frac{4}{5}$; ... by 100</p> <p>$\frac{252}{396}$?</p> <p style="text-align: right;"><i>11 mins</i></p>	<p>Notes</p>
<p>3A</p>	<p>Introduction of HCF</p> <p>T: So what about the fraction $\frac{252}{396}$?</p> <p>P₁: We can divide both the numerator and denominator by 2.</p> <p>T (writes, P1 dictates): $\frac{252}{396} = \frac{126}{198} = \dots$</p> <p>P₂: We can do it again.</p> <p>T (writes, P2 dictates): $\dots = \frac{63}{99} = \dots$</p> <p>P₃: Both the numerator and the denominator are divisible by 9.</p> <p>T (writes, P₃ dictates): $\dots = \frac{7}{11}$</p> <p>T: Is this the end?</p> <p>Ps: Yes</p> <p>T: First, you divided the numerator and denominator by 2, then by 2 again. Could you do division by 9 in two steps?</p> <p>Ps: Yes!</p> <p>T: Why didn't you?</p> <p>Ps: Because this way was quicker.</p> <p>T: Why didn't you put the first and second steps together? What would you be doing then?</p> <p>Ps: Dividing by 4.</p> <p>T: Or could you have done all the steps in one?</p> <p>Ps: Dividing by 36.</p> <p>Ps: So why didn't you do it like that?</p> <p>Ps: We couldn't tell that the numbers could be divided by 36.</p> <p>T: How could we have known this? How can we tell what is the highest divisor which is a factor of both numbers?</p> <p>Ps: From factor trees.</p> <p>T: That's right. We need to prepare factor trees for these numbers.</p>	

<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 4</p>	<p><i>Highest Common Factor (HCF)</i></p>
<p>Activity</p> <p>3B</p>	<p>P_1 and P_2 (on OHP):</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <p>T: We can see the highest common factor if we write down all the factors of the numerator and denominator. Let's see which method is quicker.</p> <p>T: Look at the fraction $\frac{39}{65}$.</p> <p>Find the HCF by writing down all the factors of the two numbers.</p> <p>P_1: $39 = 1 \times 39$ $= 3 \times 13$ Its factors are: 1, 3, 13, 39</p> <p>P_2: $65 = 1 \times 65$ $= 5 \times 13$ Its factors are: 1, 5, 13, 65</p> <p>T: So the HCF is ...?</p> <p>Ps: The number 13.</p> <p>T: Let's draw their factor trees.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>P_3:</p> </div> <div style="text-align: center;"> </div> </div> <p>T: So the answer is 13.</p> <p>T: Which do you think is the quicker method? ...</p> <p style="text-align: right;">22 mins</p>	<p>Notes</p> <p>Two volunteer Ps (at the same time) come to OHP to draw the factor trees of the numerator and denominator. Then Ps can find the common factors in them, and also the numbers remaining in the simplest form of the fraction.</p> <p>Then T introduces the highest common factor (HCF).</p>
<p>4</p>	<p>Finding HCFs using factor trees and using indices</p> <p>T: Who would like to show us how to find the HCF of the numbers 60 and 72 ?</p> <p>OS 2.8</p> <p>P_1 (after completing factor trees):</p> $60 = \underline{2} \times \underline{2} \times \underline{3} \times 5 \qquad 72 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times 3$ <p>HCF = $2 \times 2 \times 3 = 12$</p> <p>So the HCF is the product of the prime factors that are common to both numbers.</p> <p>T: Could you determine the HCF using indices?</p> <p>P_2: $60 = 2^2 \times 3^1 \times 5^1$ $72 = 2^3 \times 3^2$ HCF = $2^2 \times 3^1$</p> <p>So the HCF is the product of the common prime factors with their lowest power.</p> <p style="text-align: right;">28 mins</p>	<p>Task appears on OHP; a volunteer P comes to front to give solution, with explanation. T helps with explaining how to get HCF. T ensures that precise mathematical wording is used.</p> <p>Another P comes to write the HCF using the products of the prime factors only, giving explanations. T helps. Praising.</p>

<p>Y8</p>	<p>UNIT 2 Factors Lesson Plan 4</p>	<p><i>Highest Common Factor (HCF)</i></p>
<p>Activity</p> <p>5</p>	<p>Individual practice with HCFs.</p> <p>(1) PB 2.4, Q4 (b) 24 (d) 1 (f) 64</p> <p>(2) Add the following fractions after finding their simplest form.</p> $\frac{56}{84} + \frac{64}{48} =$ <p>P₁: $56 = 2^3 \times 7$ P₂: $64 = 2^6$</p> <p> $84 = 2^2 \times 3 \times 7$ $48 = 2^4 \times 3$</p> <p> HCF = $2^2 \times 7 = 28$ HCF = $2^4 = 16$</p> $\frac{56}{84} = \frac{2}{3}$ $\frac{64}{48} = \frac{4}{3}$ <p>T: And what is their sum?</p> <p>Ps: $\frac{6}{3} = 2$</p> <p style="text-align: right;">_____ 37 mins _____</p>	<p>Notes</p> <p>Individual work, monitored, helped.</p> <p>Verbal checking of Q4 tasks. If Ps have problems, T can ask volunteer P to show and explain on BB. For (d), T may point out that the two numbers are called 'relative primes'. (Only keen Ps will be interested!)</p> <p>For Q2, two (stronger?) Ps are asked to come to BB and show simultaneously how to determine the simplest form of the fractions.</p> <p>Correction/ self-correction.</p> <p>Praising.</p>
<p>6</p>	<p>Mental work with HCFs</p> <p>T: Now let's see how quickly you can find the HCF of two numbers.</p> <p>T: 20 and 30 Ps: 10</p> <p> 100 and 200 100</p> <p> 8 and 12 4</p> <p> 80 and 120 40</p> <p> 24 and 36 12</p> <p> 17 and 17 17</p> <p>T: Now you won't need to use factor trees every time you have to find an HCF.</p> <p style="text-align: right;">_____ 41 mins _____</p>	<p>Mental work.</p> <p>T says the pairs of numbers, Ps think, volunteer, T points to P, P answers.</p> <p>T agrees/waits for correction.</p> <p>Praises.</p>
<p>7</p>	<p>Individual work</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>On her birthday, Lisa brought sweets to school to share with her class. She brought 48 mints and 72 eclairs, and shared out both lots of sweets equally.</p> <p>What is the largest possible number of pupils in Lisa's class?</p> </div> <p><i>Solution:</i></p> <p>HCF of 48 and 72 = 24.</p> <p>The largest possible number of pupils in Lisa's class is 24.</p> <p style="text-align: right;">_____ 45 mins _____</p>	<p>Individual work, monitored, helped.</p> <p>Task appears on OHP.</p> <p>Here Ps have to discover the HCF in context. Perhaps only stronger Ps will be successful. T should help other Ps.</p> <p>After 3 minutes, T stops the work.</p> <p>Discussion, self-correction.</p> <p>Praising.</p>
	<p>Set homework</p> <p>PB 2.4, Q1</p> <p>PB 2.4, Q3</p> <p>PB 2.4, Q4 (a), (c), (e)</p>	

Y8	UNIT 2 Factors Lesson Plan 5	<i>Lowest Common Multiple (LCM)</i>
Activity 5 <i>(continued)</i>	$70 = 2^1 \times 5^1 \times 7^1$ $350 = 2^1 \times 5^2 \times 7^1$ <p>so all prime factors which are in both or in either factorisation will be in the LCM and they will have their highest index available in the two numbers.</p> <p style="text-align: right;">36 mins</p>	<p style="text-align: center;">Notes</p> <p>indices.</p> <p>(T helps with orderly and precise mathematical language.)</p>
6	<p>Individual practice with LCMs</p> <p>(1) PB 2.4, Q8 (a) 420 (b) 48 (c) 100</p> <p>(2) $\frac{3}{28} + \frac{7}{30}$ (for faster Ps)</p> <p>P (at BB): $28 = 2^2 \times 7$ $30 = 2 \times 3 \times 5$ $LCM = 2^2 \times 3 \times 5 \times 7 (= 420)$</p> $\Rightarrow \frac{3}{28} + \frac{7}{30} = \frac{3 \times (3 \times 5)}{420} + \frac{7 \times (2 \times 7)}{420}$ $= \frac{45 + 98}{420} = \frac{143}{420}$ <p style="text-align: right;">43 mins</p>	<p>Individual work, monitored, helped.</p> <p>Checking at BB: Ps dictate, T writes prime factorisations on BB for each task, explains how to determine LCM.</p> <p>Agreement, feedback, self-correction. Praising.</p> <p>Then one of the faster Ps show how to sue the result from (a) at adding fractions.</p> <p>Agreement. Praising.</p>
7	<p>Individual work with LCMs</p> <p>PB 2.4, Q9</p> <p><i>Solution: LCM of 8 and 15 = 120 (seconds)</i></p> <p style="text-align: right;">45 mins</p>	<p>Individual work.</p> <p>Ps are given 2 minutes to discover this LCM in context.</p> <p>When time is up, T asks a volunteer P to explain the solution in one or two sentences.</p>
	<p>Set homework</p> <p>(1) PB 2.4, Q7 PB 2.4, Q8 (d) - (f)</p> <p>(2) $\frac{5}{72} - \frac{7}{108}$</p> <p>(3) Activity 2.2 for stronger/interested Ps</p>	

Y8	UNIT 2 Factors Lesson Plan 6	<i>Squares and Square Roots</i>
<p>Activity</p> <p>(continued)</p>	<p>T: So what is the number?</p> <p>P₄: $3.15^2 = 9.9225 \rightarrow$ too small</p> <p>P₅: $3.17^2 = 10.0489 \rightarrow$ too large</p> <p>P₆: $3.16^2 = 9.9856 \rightarrow$ too small</p> <p>T: So?</p> <p>Ps: $3.16 < a < 3.17$</p> <p>T: I can tell you, you won't find the exact value, but you can work it out to as many decimal places as you want to.</p> <p>T: We'll use the sign $\sqrt{\quad}$ and the expression 'square root' to describe the number. So $\sqrt{10}$ is the number which, when squared, gives 10. As we've seen, $3.16 < \sqrt{10} < 3.17$.</p> <p><i>A square root is a number which, when squared (multiplied by itself), gives the first number.</i></p> <p style="text-align: right;">27 mins</p>	<p style="text-align: center;">Notes</p> <p>Finally T introduces the square root and gives the definition.</p>
<p>4</p>	<p>Square roots</p> <p>OS 2.11</p> <p>P₁: $\sqrt{49} = 7$ because $7^2 = 49$</p> <p>P₂: $\sqrt{121} = 11$ because $11^2 = 121$</p> <p style="padding-left: 40px;">etc.</p> <p style="text-align: right;">33 mins</p>	<p>Whole class activity.</p> <p>Task appears on OHP. T points to Ps, who answer with explanations (repeating the definition for each one).</p> <p>For (B), stronger Ps can answer in a similar way to previous activity.</p>
<p>5</p>	<p>Practice with squares and square roots</p> <p>PB 2.5, Q1 (a) 4, 16, 81, 121, 144, 324, 400</p> <p style="padding-left: 40px;">(b) 12, 4, 11, 2, 9, 20, 18</p> <p style="text-align: right;">38 mins</p>	<p>Individual work, monitored, helped.</p> <p>Verbal checking.</p> <p>Agreement, feedback, self-correction. Praising.</p>
<p>6A</p> <p>6B</p>	<p>Using calculators to find square roots</p> <p>PB 2.5, Q3 (a), (b), (e) (a) 2.45 (b) 3.16 (e) 7.07</p> <p>PB 2.5, Q3 (c), (d), (f) (c) 3.46 (d) 4.47 (f) 9.49</p> <p style="text-align: right;">45 mins</p>	<p>Whole class activity with all Ps finding out how their calculators work.</p> <p>Individual work, monitored, helped.</p> <p>Verbal checking.</p> <p>Agreement, feedback, self-correction. Praising.</p>
	<p>Set homework</p> <p>M 2.2 (extending Q5 with LCM)</p> <p>PB 2.5, Q2</p> <p>PB 2.5, Q8</p>	<div style="border: 1px solid black; padding: 5px;"> <p>EXTRA NOTES:</p> <p>Six lessons hardly provide sufficient time to cover this topic. If possible, an additional lesson should be used for practising these activities. Questions from Extra Exercises can be tackled by slower Ps; stronger ones can choose more interesting/challenging ones (e.g. Activity 2.3).</p> </div>