

<b>Learning Objective:</b>	To be able to express a number as a Product of Prime Factors	<b>Name:</b>	
		<b>Date:</b>	

**Do NOW Activity:**

- Write 650000 in **standard form**
- Expand**  $4x(3x - 5)$
- Work out**  $52 \times 35$
- Round 5062 correct to **2 significant figures**
- What is the **gradient** of the line  $y = 3x + 2$ ?

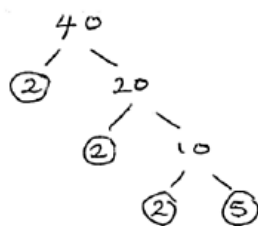
**PRIOR KNOWLEDGE CHECK:**

- I am able to identify Prime Numbers

**THE MAIN EVENT**

**WORKED EXAMPLE #1:**

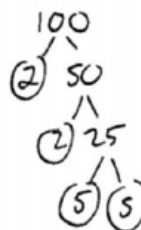
Write 40 as a product of its prime factors.



$$2 \times 2 \times 2 \times 5$$

or  $2^3 \times 5$

Express 100 as a product of its prime factors.



$$2 \times 2 \times 5 \times 5$$

.....  
 $2^2 \times 5^2$   
(2)

**PRACTICE #1:**

**Question 1:** Write each of these numbers as the product of their prime factors.

- (a) 10      (b) 12      (c) 20      (d) 18      (e) 16      (f) 30      (g) 100  
 (h) 26      (i) 24      (j) 27      (k) 42      (l) 33      (m) 38      (n) 64

**Question 2:** Write each of these numbers as the product of their prime factors. Give your answers in index form.

- (a) 36      (b) 40      (c) 28      (d) 48      (e) 80      (f) 200      (g) 75  
 (h) 32      (i) 105      (j) 81      (k) 52      (l) 242      (m) 108      (n) 500

**Question 3:** Some numbers have been written as products of their prime factors. Work out each number.

- (a)  $2 \times 7$       (b)  $2 \times 3 \times 5$       (c)  $2 \times 5 \times 11$       (d)  $2 \times 2 \times 2 \times 3$   
 (e)  $2^2 \times 5$       (f)  $3 \times 5^2$       (g)  $2^3 \times 3^2$       (h)  $3^2 \times 11$

Question 4: Write each of these numbers as the product of their prime factors.

- (a) 9000    (b) 235    (c) 392    (d) 715    (e) 444    (f) 792    (g) 5625

**WORKED EXAMPLE #2:**

Using the fact that  $12 = 2^2 \times 3$ , write each of the following as the product of prime factors in index form.

(a) 48	$48 = 12 \times 4$	(b) 108	$108 = 12 \times 9$
	$4 = 2^2$		$9 = 3^2$
	$48 = 2^2 \times 3 \times 4$		$108 = 2^2 \times 3 \times 9$
	$48 = 2^2 \times 3 \times 2^2$		$108 = 2^2 \times 3 \times 3^2$
	$48 = 2^4 \times 3$		$108 = 2^2 \times 3^3$

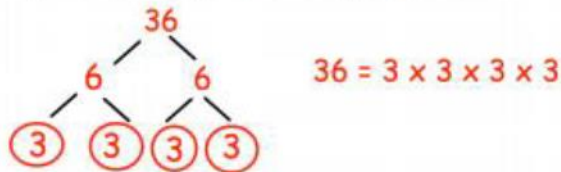
**PRACTICE #2:**

Question 2: Using the fact that  $300 = 2^2 \times 3 \times 5^2$ , write each of the following as the product of prime factors in index form.

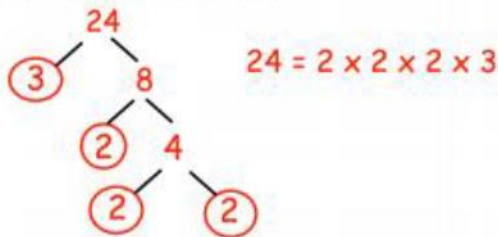
- (a) 600    (b) 150    (c) 900    (d) 3300    (e) 1500    (f) 2400

Question 3: Ashley has completed his homework.  
Can you spot any mistakes?

Express 36 as a product of its prime factors.



Write 24 as the product of its prime factors.  
Give your answer in index form.



Question 4: (a) Write 980 as a product of prime factors.  
Express your answer in index form.

(b) Find the lowest number by which 980 would need to be multiplied by  
to give a square number.

**PRACTICE #3:** Write 98 as a product of its prime factors.