GCSE - Numeracy and Mathematics **Topic:** Product of prime factors including HCF and LCM	**Tier: Intermediate**	**Grade:** **C/D/E**	GwE

Starter:

1) Which of these are prime numbers?

   12, 5, 4, 2, 18, 7, 9, 3

2) Find all the factors of 24.

3) Find the first **five** multiples of 7.

Skills:

1) What is the highest common factor of 18 and 45?

2) What is the lowest common multiple of 5 and 6?

3) What is the product of prime factors of 240?

4) What is the product of prime factors of 140?

5) Use your answers to question 4 and 5 to find the highest common factor of 240 and 140.

Top Tips!

Factor: Goes into a number
Multiple: In a number's times table

Learn the 'tree method' for finding the **Product of Prime Factors**

```
      40
     /  \
   5    8
        /  \
      4    2
     /  \
   2    2
```

40 = 2x2x2x5

= 2^3 x 5

Split the original number into two factors that when multiplied make the number.

e.g. 40 split into 5 x 8 (or 4 x 10 etc.)

Circle any prime number factors you have used (in **bold and underlined** here)

Repeat this method on any non-prime factors you have used and keep repeating until there are no more factors to split.

The circled factor are the **prime factors** of the original number.

Write these prime factors as a **product** (a multiplication).

To improve your answer use indices.

Note: It is possible to use product of prime factors and a Venn diagram to find the HCF and LCM.

Examination Question:

2015 January Link Applications U1 Higher Q1a

Berlin's main railway station is known as the Hauptbahnhof. Bellevue and Wildau are two railway stations in opposite directions from the Hauptbahnhof.
On a particular day,
• trains leave the Hauptbahnhof to Bellevue every 14 minutes
• trains leave the Hauptbahnhof to Wildau every 12 minutes.
A train to Bellevue and a train to Wildau both leave the Hauptbahnhof at 10:00. When will a train to Bellevue and a train to Wildau next leave the Hauptbahnhof at the same time?

Assessment for Learning

Video / QR code

GCSE - **Numeracy and Mathematics** **Topic:** Product of prime factors including HCF and LCM	**Tier:** Intermediate	**Grade:** C/D/E	GwE

Starter:

1) Which of these are prime numbers?

   12, 5, 4, 2, 18, 7, 9, 3

2) Find all the factors of 24.
   1, 2, 3, 4, 6, 8, 12, 24

3) Find the first **five** multiples of 7.
   7, 14, 21, 28, 35

Skills:

1) What is the highest common factor of 18 and 45?
   9

2) What is the lowest common multiple of 5 and 6?
   30

3) What is the product of prime factors of 240?
   = 2 x 2 x 2 x 2 x 3 x 5
   = 2^4 x 3 x 5

4) What is the product of prime factors of 140?
   = 2 x 2 x 5 x 7
   = 2^2 x 5 x 7

5) Use your answers to question 4 and 5 to find the highest common factor of 240 and 140.
   20

Top Tips!

Factor: Goes into a number
Multiple: In a number's times table

Learn the 'tree method' for finding the **Product of Prime Factors**

```
   40
  / \
 5   8
    / \
   4   2
  / \
 2   2
```

40 = 2x2x2x5

= 2^3 x 5

Split the original number into two factors that when multiplied make the number.

e.g. 40 split into 5 x 8 (or 4 x 10 etc.)

Circle any prime number factors you have used (in **bold and underlined** here)

Repeat this method on any non-prime factors you have used and keep repeating until there are no more factors to split.

The circled factor are the **prime factors** of the original number.

Write these prime factors as a **product** (a multiplication).

To improve your answer use indices.

Note: It is possible to use product of prime factors and a Venn diagram to find the HCF and LCM.

Examination Question:

2015 January Link Applications U1 Higher Q1a

Berlin's main railway station is known as the Hauptbahnhof. Bellevue and Wildau are two railway stations in opposite directions from the Hauptbahnhof.
On a particular day,
• trains leave the Hauptbahnhof to Bellevue every 14 minutes
• trains leave the Hauptbahnhof to Wildau every 12 minutes.
A train to Bellevue and a train to Wildau both leave the Hauptbahnhof at 10:00. When will a train to Bellevue and a train to Wildau next leave the Hauptbahnhof at the same time?
LCM of 12 and 14 is 94
Every 94 minutes a train leaves for Bellevue and for Hauptbahnhof
94 minutes after 10:00 is **11:34**

Assessment for Learning

Video / QR code