

Multiples, Factors and Prime Factors

- Q8** The prime factor decomposition of a certain number is $3^2 \times 5 \times 11$.
- Write down the number.
 - Write down the prime factor decomposition of 165.

- Q9**
- Write down the first ten square numbers.
 - From your list, pick out all the multiples of 2.
 - From your list, pick out all the multiples of 3.
 - From your list, pick out any cube numbers.
 - Add the numbers in your list together and write down the prime factor decomposition of the total.



- Q10** Gordon is doing some woodwork and needs to calculate the volume of a wooden rectangular block (a cuboid). The length of the block is 50 cm, the height is 25 cm and the width is 16 cm.
- What is the volume (in cm^3) of the wooden block?
 - Express the number found in part a) as a product of its prime factors.
 - Gordon needs to cut the block into smaller blocks with dimensions 4 cm $\times$ 5 cm $\times$ 5 cm. What is the maximum number of small blocks Gordon can make from the larger block? Make sure you show all your working.

- Q11** The prime factor decomposition of a certain number is $2^3 \times 5 \times 17$.
- What is the number?
 - What is the prime factor decomposition of half of this number?
 - What is the prime factor decomposition of a quarter of the number?
 - What is the prime factor decomposition of an eighth of the number?

- Q12** Bryan and Sue were playing a guessing game. Sue thought of a number between 1 and 100, which Bryan had to guess. Bryan was allowed to ask five questions, which are listed with Sue's responses in the table below.

Bryan's Questions	Sue's Responses
Is it prime?	No
Is it odd?	No
Is it less than 50?	Yes
Is it a multiple of 3?	Yes
Is it a multiple of 7?	Yes

Use the questions to narrow down the possible numbers — keep going until you only have one left.

What is the number that Sue thought of?

