Factors, Multiples, Primes, Square Numbers and Cube Numbers – Home Learning

A factor is a number that divides **into** another number without leaving a remainder. It can make sense to list factors in pairs.
For example, the factors of 6 are:
1 and 6, 2 and 3.

A multiple is a number that is in that number's times table.
For example, the first four multiples of 5 are:
5, 10, 15 and 20.

A prime number is an integer (whole number) that has **exactly** two factors, 1 and itself.
Be careful - 1 is not a prime number as it only has one factor!
The first few prime numbers are 2, 3, 5, 7, 11, 13, 17 and 19.

A square number is the result of multiplying a number by itself.
For example, 5×5 (or 5^2) = 25
Therefore, 25 is a square number.

A cube number is the result of multiplying a number by itself once, then twice.
For example, $2 \times 2 \times 2$ (or 2^3) = 8
Therefore, 8 is a cube number.

You should learn these square and cube numbers off by heart:

Square	**Cube**
$1^2 = 1$	$1^3 = 1$
$2^2 = 4$	$2^3 = 8$
$3^2 = 9$	$3^3 = 27$
$4^2 = 16$	$4^3 = 64$
$5^2 = 25$	$5^3 = 125$
$6^2 = 36$	
$7^2 = 49$	
$8^2 = 64$	
$9^2 = 81$	
$10^2 = 100$	$10^3 = 1000$
$11^2 = 121$	
$12^2 = 144$	

Once you know these numbers, you can find square roots and cube roots. To find the square root of a number, you find the number that, when you square it, gives that number.
For example, the square root of 49 (written $\sqrt{49}$) is 7.
The cube root of 125 (written $\sqrt[3]{125}$) is 5.

Finally, the reciprocal of a number is found by dividing 1 by that number. If the number is already a fraction, we "flip" it by switching the numerator and denominator.

For example, the reciprocal of 3 is $\frac{1}{3}$

The reciprocal of $\frac{2}{7}$ is $\frac{7}{2}$.

Your Turn

1. Write down all the factors of:

   a. 20

   b. 32

   c. 25

   d. 49

   e. 80

   Challenge: Compare the number of factors that 20, 32 and 80 have with the number of factors 25 and 49 have. What do you notice?

2. List the first four multiples of:

   a. 3

   b. 7

   c. 10

   d. 12

   Challenge: Use your lists to find the lowest common multiple of 3 and 12.

3. Which of these numbers is not a prime number?

   2, 9, 41

   Challenge: The number 22 has two prime factors. What are they?

4. Evaluate:

a. 3 squared

b. 2 cubed

c. 10 squared

d. $\sqrt{25}$

e. $\sqrt{81}$

f. $\sqrt[3]{27}$

Challenge: Which of the following is both a square number and a cube number?

4, 8, 64, 100

5. Write down the reciprocal of:

a. 7

b. 9

c. 11

d. $\frac{3}{4}$

e. $\frac{5}{8}$

Challenge: Find the reciprocal of:

a. 0.3

b. $1\frac{2}{3}$

(Hint: write 0.3 as a fraction and write $1\frac{2}{3}$ as an improper fraction).