# Working with standard form: diagnostic exercises

***Education in Chemistry*  
March 2020**[**rsc.li/2P7Bkpx**](https://rsc.li/2P7Bkpx)

**Use these diagnostic questions to assess your students’ fluency with standard form notation. Once you have their responses, use course A, B or C from the article for your next lesson.**

Students shouldn’t use calculators for these diagnostic exercises.

## Diagnostic question, age groups 14–16 or post-16

Select the box which only contains numbers which can also be expressed as 10.

|  |  |
| --- | --- |
| 1 x 100 10 x 10-1  0.001 x 104 100000000 x 10-6 | 101 0.000001 x 106 100 x 101/2  0.1 x 102 10000000 x 10-7 |
| 101 1 x 101 10 x 100  0.1 x 102 1000 x 10-2 | 1000000 x 106 1 x 100 10 x 101  0.01 x 10-2 0.001 x 10-3 |

### Diagnostic question, post-16

Which quantity is the largest?

|  |  |
| --- | --- |
| The number of oxygen atoms in a room at standard room temperature and pressure.  Room dimensions = 4 x 5 x 2.5 m3 | The number of electrons required to power a 14A bulb for an hour.  Charge on an electron = 1.602 x 10-19 C  Charge (C) = Current (A) x Time (s) |
| The number of chlorine atoms in 2 litres of chloroform (CHCl3).    Chloroform has a density of 1.49 g cm-3 | The number of carbon atoms in a line of carbon atoms (touching side to side) to the sun and back.  Distance to the sun = 149 million km  Atomic radius of carbon = 75 pm |