**Age 14+  Level ★★**
**Worksheet 3**
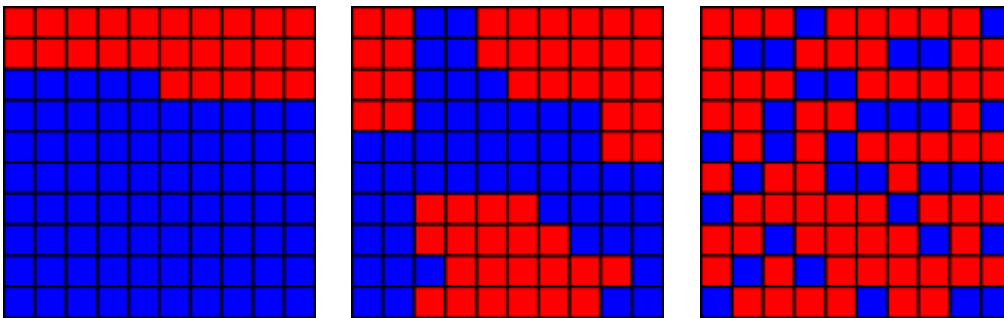
1.  **Algebraic Average**
    The mean of three numbers $x$, $y$ and $z$ is $x$.
    What is the mean of $y$ and $z$?

2.  **Maximum Mean**
    The mode of nine numbers between 0 and 100 is 12, the median is 41, and the range is 75.
    What is the largest possible value of the mean?
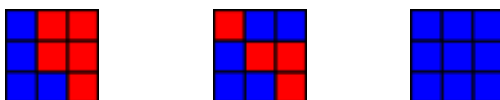
3.  **Sample**
    Here are three populations:



An opportunity sample, a systematic sample and a random sample was taken from each.
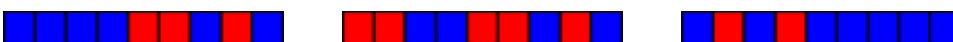
Can you match the samples to the populations?

**Opportunity samples** (a convenient block of 9 squares was chosen):



**Systematic samples** (every 11<sup>th</sup> square was chosen to give a sample size of 9):



**Random samples** (9 squares were chosen at random):



*These problems are adapted from UKMT (ukmt.org.uk) and WMC (competition.ac) problems.*