Age 14+ Level ★★
Worksheet 1

1. Smallest Range

Four integers are chosen so that their mean is 2017.
The integers are all different.

What is the smallest possible range that the 4 integers could have?

2. Equal Means

What value of x makes the mean of the first three numbers in this list equal to the mean of the last four?

$$15 \quad 5 \quad x \quad 7 \quad 9 \quad 17$$

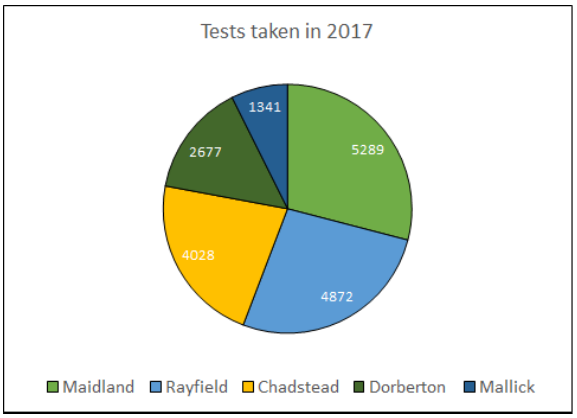
3. Dopey Measurement

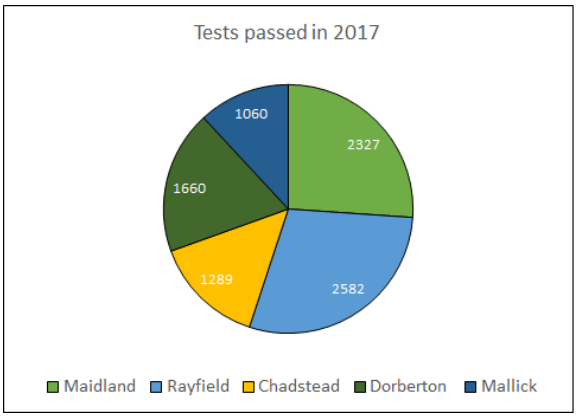
Snow White wanted to know the mean height of the Seven Dwarfs. One day she measured them all as they left for work and calculated their mean height as 112.3 cm. Doc complained that she had left him out and measured Dopey twice without him noticing.

If Doc is 3 cm taller than Dopey, what is the mean height of the Seven Dwarfs correct to one decimal place?

4. Driving Test

Here are two pie charts with data about 5 different driving test centres. Which test centre has the highest pass rate?





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

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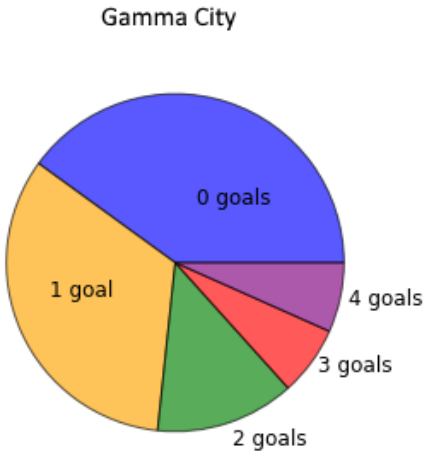
Worksheet 2

1. Gamma City

Gamma City have played fifteen games in their league.

The pie chart shows how many goals they scored in each of their matches.

Can you find the mode and median number of goals scored by Gamma City?



2. Mean Median

The mean weight of five children is 45 kg.

The mean weight of the lightest three children is 42 kg and the mean weight of the heaviest three children is 49 kg.

What is the median weight of the children in kg?

3. Acceptance Rate

The mean number of students accepted by a school in the four years 2007 to 2010 was 325.

The mean number of students accepted by the school in the five years 2007 to 2011 was 4% higher.

How many students did this school accept in 2011?

4. A Mean Calculation

Can you work out the mean of this set of numbers without using a calculator?

97 97 98 99 99 99 100 100 101 101 103 104 104 105

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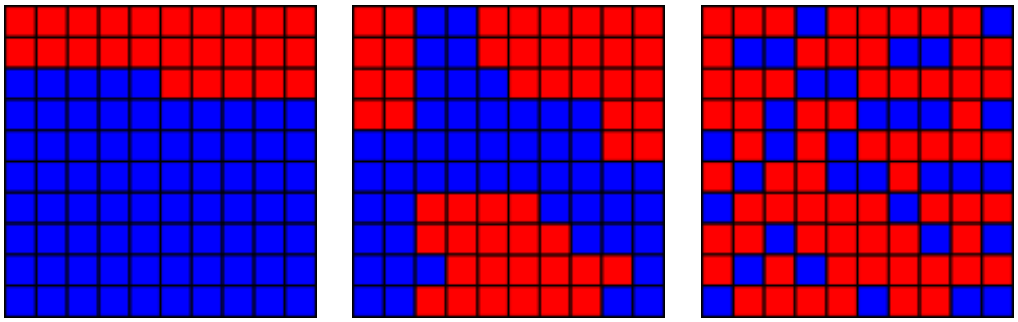
Worksheet 3

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?

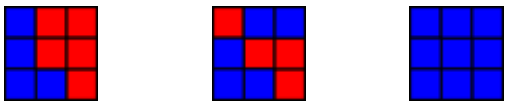
3. **Sample**
   Here are three populations:



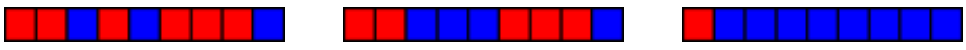
An opportunity sample, a systematic sample and a random sample was taken from each.

Can you match the samples to the populations?

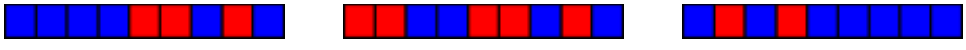
Opportunity samples (a convenient block of 9 squares was chosen):



Systematic samples (every 11th square was chosen to give a sample size of 9):



Random samples (9 squares were chosen at random):



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