

**Age 14+ Level ★★
Worksheet 2****1. Solitaire**

After playing 500 games, my success rate at Solitaire is 49%.

Assuming I win every game from now on, how many extra games do I need to play in order to increase my success rate to 50%?

2. Breakfast Time

The hobbits Frodo, Sam, Pippin and Merry have breakfast at different times. Each one takes a quarter of the porridge they find in the pan, thinking that the others have not yet eaten.

What fraction of the porridge is left after all four hobbits have had their breakfast?

3. Percentage of a Quarter

What percentage of $\frac{1}{4}$ is $\frac{1}{5}$?

4. Percentage Swap

What is 50% of 2007 plus 2007% of 50?

5. Itchy's Fleas

Itchy the dog has a million fleas. His anti-flea shampoo claims to leave at most 1% of the original number of fleas.

What is the minimum number of fleas that the shampoo will remove?

6. Coal Truck

The mass of an empty coal truck before it is loaded is 2000 kg. At the start of a day it is loaded with coal, and the coal makes up 80% of the total mass.

At the first delivery, the driver unloads a quarter of the coal. Can you express the mass of coal left on the truck, as a percentage of the total mass, after the driver made the first delivery?

7. Percentage Unchanged

If the base of a rectangle is increased by 10% and the area is unchanged, by what percentage (exactly) is the width decreased?

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