

**Age 14+ Level ★★★
Worksheet 3****1. Descending Deal**

The cards in a set of 36 are numbered 1 to 36.
The cards are shuffled and four cards are dealt.

What are the chances of them being dealt in descending order?

2. Counting Kangaroos

Rachel draws 36 kangaroos using three different colours.
25 of the kangaroos are drawn using some grey, 28 are drawn using some pink and 20 are drawn using some brown.
Five of the kangaroos are drawn using all three colours.

How many kangaroos did she draw that use only one colour?

3. Different Digital Clock

A digital clock uses two digits to display hours, two digits to display minutes and two digits to display seconds, e.g. 10:23:42.

How many times between 10:00:00 and 11:00:00 on the same morning are all six digits different?

4. Numbers or Letters?

Here are two games that you might play:

Game One:

You have a bag of 26 tiles, each with a different letter of the alphabet.

You choose a tile, write down the letter, and put it back in the bag.

Then you choose a second tile, write down the letter, and put it back in the bag. Then you choose a third tile.

If the three letters came out in strictly ascending alphabetical order, you win. Otherwise, you lose.

Game Two:

You roll a 10-sided dice three times, writing down the number that is shown each time. If the three numbers are in strictly ascending numerical order, you win. Otherwise, you lose.

Which game offers you the best chance of winning?

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