Age 14+ Level ★★
Worksheet 2

1. **Divisible Palindrome**
   Palindromic numbers read the same backwards and forwards, e.g.
   7227 or 10101.
   What is the sum of the digits of the largest 4-digit palindromic
   number which is divisible by 15?

2. **Sticky Fingers**
   Ruth has glued 2009 unit cubes together to form a cuboid.
   She opens a pack containing 2009 stickers, and she has more than
   enough to place one sticker on each exposed face of each unit cube.

   How many stickers does she have left?

3. **Eight Factors Only**
   A certain positive integer has exactly eight factors.
   Two of these factors are 15 and 21.
   What is the sum of all eight factors?

4. **Times and Square**
   Roger picks two consecutive integers, one of which ends in a 5.
   He multiplies the integers together and then squares the result.
   What are the last two digits of his answer?

5. **Relative Time**
   Albert Einstein is experimenting with two unusual clocks which both
   have 24-hour displays. One clock goes at twice the normal speed.
   The other clock goes backwards, but at the normal speed.

   Both clocks show the correct time at 13.00.
   At what time do the displays on the clocks next agree?

6. **Long List**
   I want to write a list of integers containing two square numbers, two
   prime numbers and two cube numbers.
   What is the smallest number of integers that could be in my list?

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