I made a number line from 0 to 20 and folded it as shown below:



I folded it through the 4 and the 8 so that the 0 is on top of the 8 and the 4 is on top of the 12.

I then folded it through the 12 and the 16 so that now the 0 is on top of 8 which is on top of 16, and the 4 is on top of the 12 which is on top of the 20.

I ended up with some stacks of numbers that are on top of each other.

For example:

* 1, 7, 9, 15 and 17 make a stack which has a total of 49.
* The stack of 0, 8 and 16 has a total of 24.
* The stack made of 3, 5, 11, 13 and 19 has a total of 51.

We will be focusing on totals made in this way (like 49, 24 and 51 above).

#### **The challenges below involve varying the length of the number line. However, you must always start with 0 and each folded section must be the same length. There must always be at least one fold in the number line and folds must go through a number.**

#### **Challenge 1**

Find three different ways to get a 'stack total' of 36 using lengths of 21 to 36 inclusive, showing exactly how you fold the number lines.

#### **Challenge 2**

Find as many ways as you can to get a 'stack total' of 48 using lengths of 21 to 36 inclusive, again showing exactly how you fold the number lines.

#### **Challenge 3**

Now using lengths from 21 to 50 inclusive, find a length which contains **all** the stack totals of 69, 70 and 71 when folded.