

## Worksheet Activity: Counting higher than 31

Look at the binary cards again. If you were going to make the next card in the sequence, how many dots would it have? What about the next card after that? What is the rule that you are following to make your new cards? As you can see, only a few cards are needed to count up to very big numbers.

If you look at the sequence carefully, you can find a very interesting relationship:

**1, 2, 4, 8, 16...**

Try adding:  $1 + 2 + 4 = ?$  What does it come to?

Now try  $1 + 2 + 4 + 8 = ?$

What happens if you add all the numbers up from the beginning?

Have you ever heard of "let your fingers do the walking"? Well now you can let your fingers do the counting, but you can get much higher than ten—no, you don't have to be an alien! If you use the binary system and let each finger on one hand represent one of the cards with dots you can count from 0–31. That's 32 numbers. (Don't forget that zero is a number too!)

Try counting in order using your fingers. If a finger is up it is a one, and if it is down it is a zero.

You can actually get from 0–1023 if you use both hands! That's 1024 numbers!

If you had really bendy toes (now you would have to be an alien) you could get even higher. If one hand can be used to count 32 numbers, and two hands can count to  $32 \times 32 = 1024$  numbers, what is the biggest number Miss Flexi-Toes can reach?

