

Braille is one of the most important codes in the world – it is used by visually impaired people to read and write.

It is easy: there are six dot positions, and the dots are raised up (so you can feel them) in special patterns.

Each pattern of dots is a 'character' (a letter or number, etc.)

1. Can you find an item at home that has braille on it?
2. Estimate how many different combination of symbols can be made with this six-dot array?



A good estimate would be at least more than 36 but less than 100.

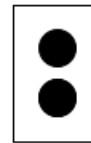
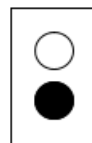
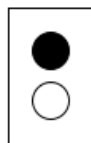
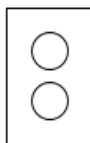
### Let's find a pattern.

If Braille was only made of one dot, how many combinations are there?



It can either be raised or not raised therefore 2 possibilities.

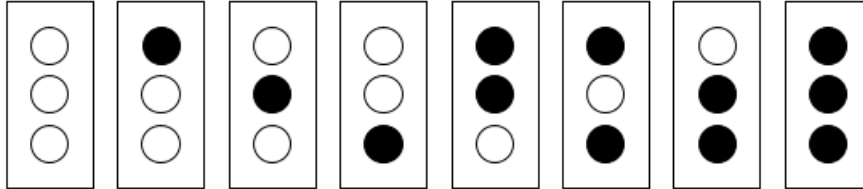
If Braille was made of two dots, how many combinations are there?



There are 4 different possibilities.

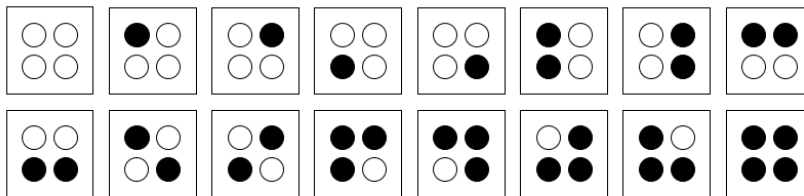
3. How many possibilities are there with three dots?

Draw them. *(There may be more/less diagrams than needed)*

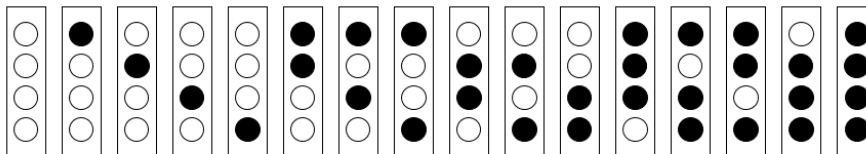


Eight

b) How many possibilities are there with four dots?



Sixteen



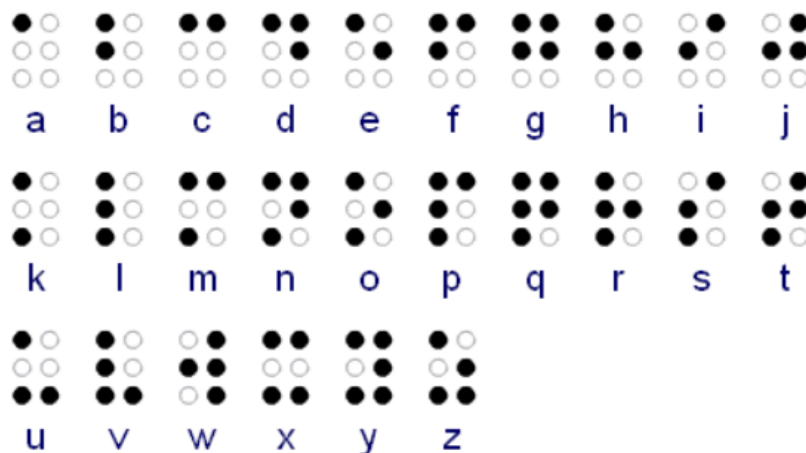
c) Can you work a pattern?

Numbers of dots	Numbers of different possibilities
1	2
2	4
3	8
4	16
5	32
6	64

d) Why do you think a 6-dot array was chosen for braille?

- Napoleon wanted a code that soldiers could use to communicate silently and without light at night. The original system of 12 raised dots **was too difficult** for soldiers, so was rejected.
- A 7-array dot would give 128 different combinations and this could be difficult and useless.
- The finger could not feel the whole symbol without moving. Six symbols which could easily be felt.

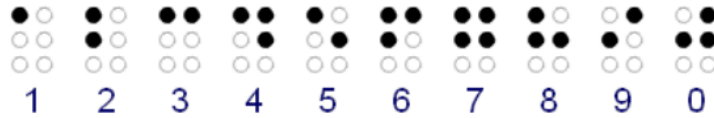
These are the dot patterns for the 26 letters of the alphabet:



4. Are there any similarities/differences between the first group of letters? (a to j) and the second group of letters (k to t)?

- k to t are like a to j, just with an extra dot in the lower left corner.
- Also, if you took out w, then u to z is like a to e but with two extra dots ...
- (Interesting fact: the original code didn't include w!)

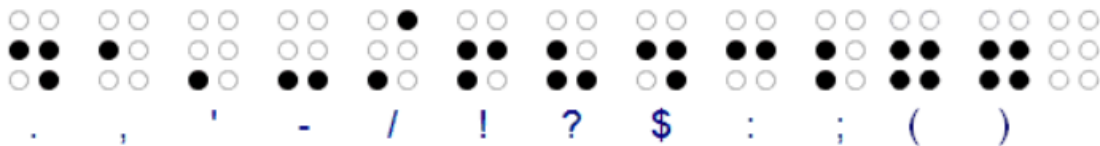
## Numbers



The patterns for the numbers are **exactly the same** as for the letters **a to j**. So there is this special character to put in front of numbers:



## Punctuation



## Capital Letters



Capital Letters are shown by putting this special character in front of them

- Can you write your name in braille?  
Do not forget to use the capital letter symbol!

6. What does this say?



(Capital Letter) Maths is fun

7. Write a simple message to your friends in braille.

8. This is the basic braille alphabet, braille numbers and braille punctuation.

Can you find 3 more facts about braille?

- Braille, named after its inventor Louis Braille.
- The origins of braille come from the French army in 1819. Soldiers created a military code called 'night writing' so they could communicate in darkness without speaking. As a young boy, Louis Braille learned about 'night writing' and at the age of 15 developed a more usable and streamlined version of the braille alphabet as the military code was too complex.
- Although there are 64 combinations Braille cell allows 63 possible combinations of dots. The empty array (no dots raised) is not used but for space.
- Strong group letters such as 'th', 'sh' and 'ing' has their own combination.
- 'b' is also used for the frequent word 'but' among others.