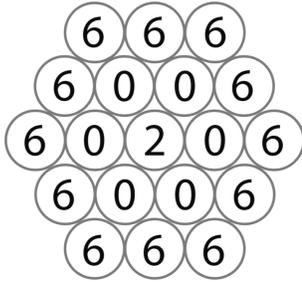# MATH 5: HOW TO COUNT WITHOUT COUNTING.

1. (a) In how man ways can you punch the number 206 on the digital lock (see the picture) if you start from the button in the center and every next button should be touching the button you just punched?

(b) In how many ways can you trace the word BOOGIE in the table below? (You can move from cell to cell if they share a side or a corner.)

E	I	G	I	E
I	G	O	G	I
G	O	B	O	G
I	G	O	G	I
E	I	G	I	E

2. (a) A palindromic number is a number that reads the same backward and forward. (For example, 13,531 is palindromic.) How many 5-digit numbers are palindromic?

(b) How many 5-digit numbers are palindromic and consist of distinct digits?