NUMBER PATTERNS appear in many disciplines – Social Sciences, Business, Allied Health, Science. Squares and Square Roots are common number patterns.

SQUARE NUMBERS

These are numbers which are the square of the natural numbers (1, 2, 3, 4, 5, 6, 7, …), those that occur ‘in nature’. For instance, 1, 2, 4, 9, 25 and 36 are the first six square numbers, as partially-shown in the diagram. (Yes, 1 is missing!) The ‘square’ function is shown by the index (or exponent or power) 2 in the superscript to the natural number.

ACTIVITY 1: Create some more square numbers.

How about the ‘next’ one if this diagram was bigger? And the next? Continue until you get to at least 225. Continue on further if you wish, with every few natural numbers; why not go as far as 900? (Easier than it sounds). Do you see a pattern after 100? (This will help with Activity 3.)

SQUARE ROOTS

We use this special symbol. It is the inverse of square.

A brief explanation is the example diagram, here:

For some of the natural numbers, their square roots become easy if you use the square numbers above.

Note that every positive number a has two square roots: √a, which is positive, and −√a, which is negative. Together, these two roots are denoted ±√a.

SQUARE ROOTS of numbers which are not themselves SQUARE NUMBERS.

ACTIVITY 2: What is the positive square root of 55?

Method: Use your knowledge of SQUARE NUMBERS. Without a calculator, you know that 55 is ‘somewhere between’ 49 and 64. Hence the square root of 55 is ‘somewhere between’ 7 and 8. If you want more accuracy, use a calculator.

ACTIVITY 3: What is the positive square root of 6,500?

Method: Use your knowledge of SQUARE NUMBERS and your discoveries from completing ACTIVITIES 1 & 2. Your answer is likely to be just a bit more than 80. Why?

MORE ACTIVITIES. Highly-recommended are these two videos

Maths Antics: Intro to exponents [https://www.youtube.com/watch?v=ZJDb7E6aCrA]

Maths Antics: Exponents and Square roots [https://www.youtube.com/watch?v=ZJDb7E6aCrA]