WORKSHEET – PATTERN DETECTION

CHART – Comparison of Base-10 and Base-2.

Base-10	Base-2	Base-10	Base-2	Base-10	Base-2	Base-10	Base-2
0	0	5	101	10	1010	15	1111
1	1	6	110	11	1011	16	10000
2	10	7	111	12	1100	17	10001
3	11	8	1000	13	1101	18	10010
4	100	9	1001	14	1110	19	10011

PATTERN ANALYSIS #1 (Powers of two)

a) Let's analyze the binary value for the powers of 2 by filling the following table:

Power of 2	Base-10	Base-2
2^0		
2^1		
2^2		
2^3		
2^4		

b) What pattern can you see in the base-2 values?

PATTERN ANALYSIS #2 (Odd & Even)

c) All odd numbers have a common ending. What is it?

d) All even numbers have a common ending. What is it?

PATTERN ANALYSIS #4 (Additions)

e) Write each of the following additions in base-2 instead. The first one is done for you.

16	1000	3	10	13
+2	+ 10	+8	+4	−4
18	1010	11	14	9

f) Can you see how the additions work?