**Subject:** Mathematics

**Topic:** Numbers and Counting

**Subtopic**: The binary system

Level: S.1

### **Background information:**

This is the beginning of the third lesson in this topic. Students have just learnt the denary system in Lesson 2.

### **Learning objectives:**

### 1. Content:

Students should be able to state the place value of each digit in the binary system.

# 2. Language:

Students should be able to state the place value of each digit in the binary system by using the following sentence pattern:

The digit underlined is in the place value of \_\_\_\_\_. If you count from the right to the left, then

# S.1 Mathematics Numbers and Counting The binary system Worksheet 1

Name:	Class:	No.:	Date:
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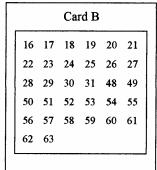
### Task 1: Magic Trick

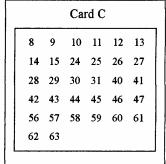


#### **Instructions:**

(i) Look at the 6 cards below.

			Ca	rd A		
	32	33	34	35	36	37
	38	39	40	41	42	43
	44	45	46	47	48	49
ŀ	50	51	52	53	54	55
	56	57	58	59	60	61
	62	63				
1						





_			Ca	rd D	1	
	4	5	6	7	12	13
1	14	15	20	21	22	23
1	28	29	30	31	36	37
	38	39	44	45	46	47
	52	<b>5</b> 3	54	55	60	61
	62	63				
L						

			Car	rd E		
	2	3	6	7	10	11
	14	15	18	19	22	23
	26	27	30	31	34	35
	38	39	42	43	46	47
ļ	50	51	54	55	58	59
	62	63				
L						

		C	ard l	F		
1	3	5	7	9	11	
13	15	17	19	21	23	
25	27	29	31	33	35	
37	39	41	43	45	47	
49	51	53	55	57	59	
61	63					

- (ii) Select a number from one of the cards. Do not tell others what the number is. When asked by the teacher, tell the class from which card you have selected the number.
- (iii) The teacher can tell you which number you have selected.
- (iv) Now, work in groups of 4 and discuss why you think the teacher knows the number. [Hint: Think about the place values of digits in a binary number.]

# Task 2



# Instructions:

- (i) Work in pairs.
- (ii) Student A and Student B individually work out the place value of the underlined digits in the binary numbers given.

What is the place	e value of each of the	underlined digits
in the following b	inary numbers?	
(a) 1 <u>1</u> 01	(b) 100 <u>0</u> 1	(c) <u>1</u> 100
(d) 11 <u>1</u>	(e) <u>1</u> 0101	(f) <u>1</u> 0
Write your answe	ers below:	
(a)		
(b)		
(c)		
(d)		
(e)		
(f)		, ,
		1/

(III)	Student A and Student B then take turns to check answers to the questions by asking
	and answering in the following way until you agree on an answer:
	A: The answer to Question a is because the digit underlined is in the place value
	of
	B: My answer is the same. OR My answer is different. I think the answer should
	be because the digit underlined is in the place value of If you count
	from the right to the left, then
	A: OK, I agree. OR I think you're wrong. It should be If you count from the
	right to the left,