CoEA Module 1 Case Study 1 *Snakes and Ladders*

The resources for this Case Study consist of

Teacher Notes		
Case Study Resource Sheet	CR1	*Snakes and Ladders (1)*
" " " "	CR2	*Snakes and Ladders (2)*
" " " "	CR3	*'Blank' Snakes and Ladders (3)*
Worksheet WS1		*Beginnings and Ends!*
Homework Sheet HW1		*Beginnings and Ends!*
Worksheet WS2		*Missing Numbers*
Homework Sheet HW2		*Missing Numbers*
Worksheet WS3 (2 pages)		*Play the Game*
Test 1 (2 pages)		

Case Study 1 *Snakes and Ladders*

Teacher Notes

1. In pairs, students play the game of *Snakes and Ladders* on a pre-designed board (CR1).

   You will need 2 dice and 2 counters for each pair. This could form a competition where the winner moves on each time.

2. Class discussion based on OHP of *Snakes and Ladders* board.

   Questions such as:

   (a) Circle all even numbers at the top of snakes,

   (b) Where does the snake starting at .... end?

   (c) How many squares do you go up/down on a particular snake or ladder?

3. Follow up with worksheet (WS1) using CR1 and homework sheet (HW1) using a copy of CR2.

4. Play a class game with OHP and two students moving different shaped counters. Others roll the two dice. Before each throw ask questions such as:

   (a) How many do you need to get to the bottom of the next ladder?

   (b) How many do you need to avoid the top of the next snake?

   (c) How can we score this number on the dice?

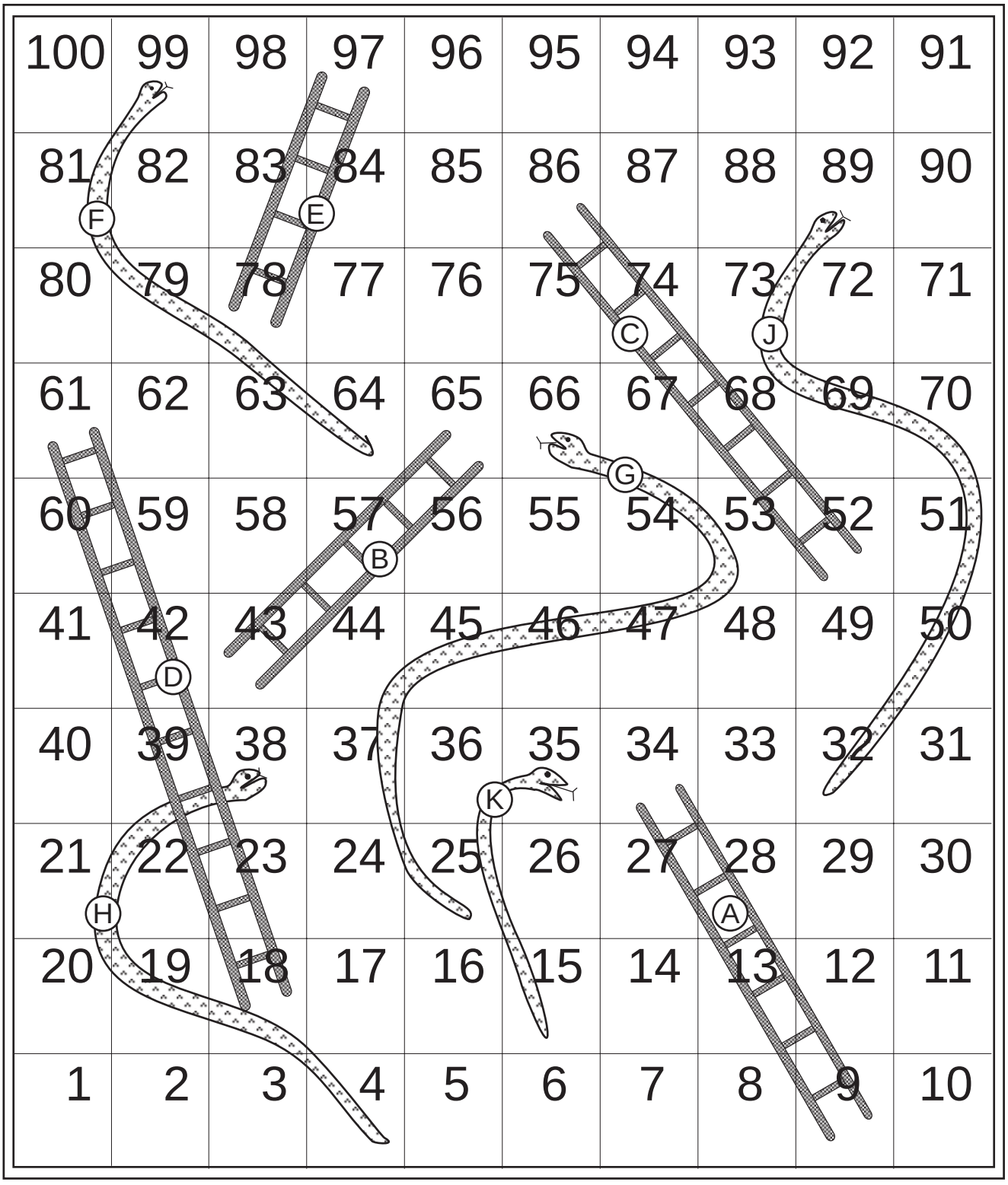
   (d) Write these pairs as a sum on the board.

5. Do WS2: *Missing Numbers* and then WS3: *Play the Game.* WS3 requires a great deal of concentration and needs to be recorded accurately. The homework (HW3) is consolidation of number bonds.

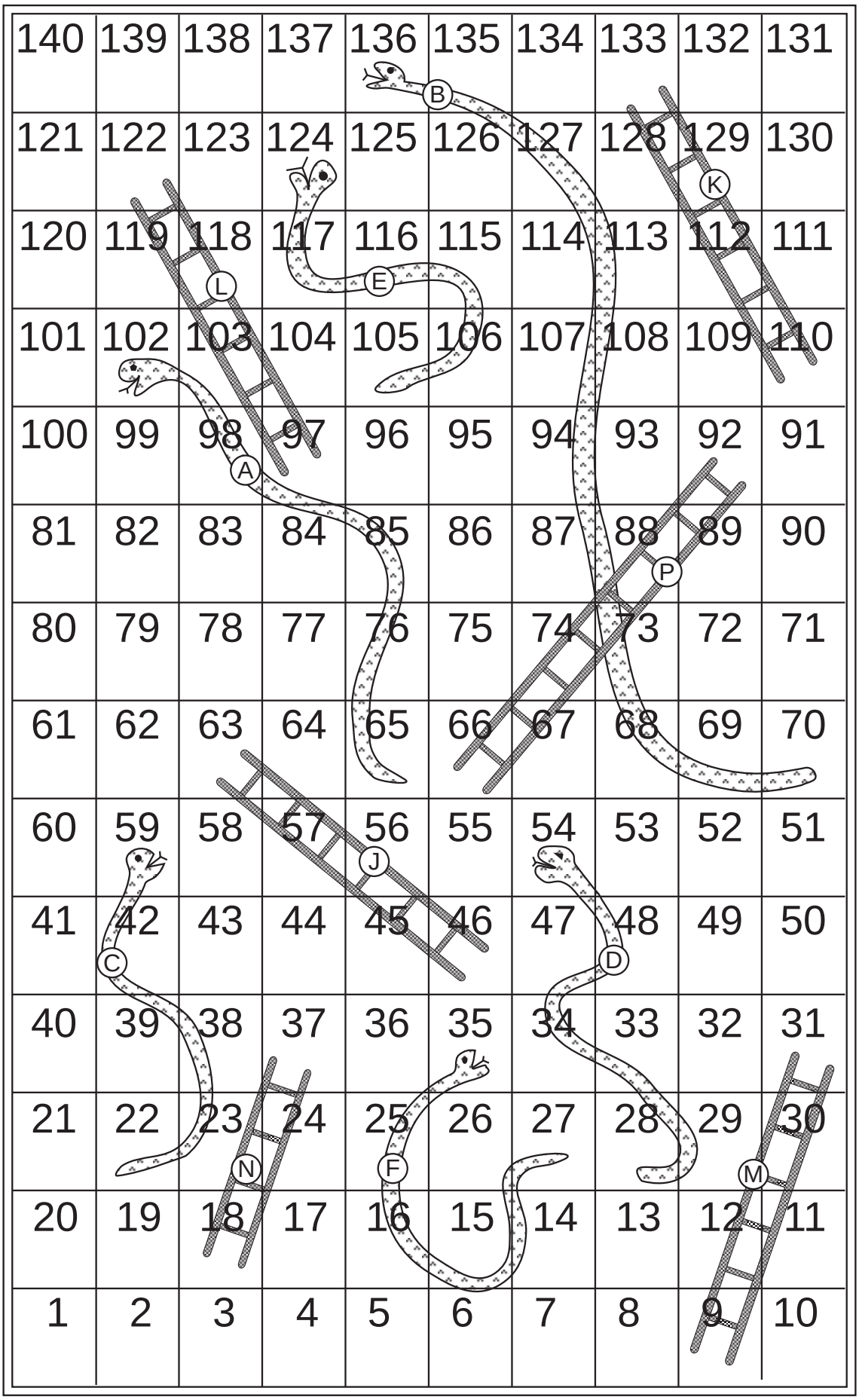
6. Check homework and then design own version of *Snakes and Ladders* board (CR3) , following certain criteria, e.g. use 5 snakes and 5 ladders.

   This activity could form part of a homework task and then the student-designed boards could be used on OHP sheets in a follow up lesson, or the game could be played using the student-designed boards.

Case Study 1, CR1 *Snakes and Ladders (1)*



Case Study 1, CR2 *Snakes and Ladders (2)*



Case Study 1, CR3 *Snakes and Ladders (3)*

100	99	98	97	96	95	94	93	92	91
81	82	83	84	85	86	87	88	89	90
80	79	78	77	76	75	74	73	72	71
61	62	63	64	65	66	67	68	69	70
60	59	58	57	56	55	54	53	52	51
41	42	43	44	45	46	47	48	49	50
40	39	38	37	36	35	34	33	32	31
21	22	23	24	25	26	27	28	29	30
20	19	18	17	16	15	14	13	12	11
1	2	3	4	5	6	7	8	9	10

Case Study 1, WS1 *Beginnings and Ends!*

You will need sheet CR1

1. Copy and complete the table.

Ladder	*Begin*	*End*		*Snake*	*Begin*	*End*
A				F		
B				G		
C				H		
D				J		
E				K		

2. Copy and complete the table.

Ladder	*Number of squares moved up*		*Snake*	*Number of squares moved down*
A			F	
B			G	
C			H	
D			J	
E			K	

3. Write down any **even** number at the **top** of a **snake**.

4. Write down any **even** number at the **top** of a **ladder**.

5. Write down any **odd** number at the **bottom** of a **ladder**.

6. Write down any **odd** number at the **bottom** of a **snake**.

7. List the **snakes** that go from an **odd** number to an **even** number.

8. List the **snakes** that go from an **even** number to an **odd** number.

9. List the **ladders** that go from an **odd** number to an **even** number.

10. List the **ladders** that go from an **even** number to an **odd** number.

Case Study 1, HW1 *Beginnings and Ends!*

You will need sheet CR2

1. Copy and complete the table.

Snake	*Begin*	*End*	*Ladder*	*Begin*	*End*
A			F		
B			G		
C			H		
D			J		
E			K		
F			L		

2. Copy and complete the table.

Snake	*Number of squares moved down*	*Ladder*	*Number of squares moved up*
A		F	
B		G	
C		H	
D		J	
E		K	
F		L	

3. Write down any **even** number at the **top** of a **snake**.

4. Write down any **even** number at the **top** of a **ladder**.

5. Write down any **odd** number at the **bottom** of a **ladder**.

6. Write down any **odd** number at the **bottom** of a **snake**.

7. List the **snakes** that go from an **odd** number to an **even** number.

8. List the **snakes** that go from an **even** number to an **odd** number.

9. List the **ladders** that go from an **odd** number to an **even** number.

10. List the **ladders** that go from an **even** number to an **odd** number.

11. (a) Which snakes and ladders have you **not** listed?

    (b) Why haven't you used them?

Case Study 1, WS2 *Missing Numbers*

1. Copy these and then fill in the boxes. The first one has been done for you.

8 + 5 = 13 □ + □ = 13 □ + □ = 13

□ + □ = 22 □ + □ = 22 □ + □ = 22

2. Copy these and then fill in the boxes. Notice the different totals.

□ + □ = 20 □ + □ = 19 □ + □ = 25

□ + □ = 18 □ + □ = 15 □ + □ = 28

3. Copy these and then fill in the boxes by finding two **odd** numbers that give a total of 12

(a) □ + □ = 12 (b) □ + □ = 12

(c) □ + □ = 12 (d) □ + □ = 12

4. Copy these and then fill in the boxes by finding two **even** numbers that give a total of 18.

(a) □ + □ = 18 (b) □ + □ = 18

(c) □ + □ = 18 (d) □ + □ = 18

5. Copy these and then fill in the boxes by writing in the missing numbers in the shapes.

(a) □ + 5 = 8 (b) ◯ + 11 = 15

(c) 17 + □ = 26 (d) □ + 17 = 29

(e) ◯ + 12 = 27 (f) ◯ + 16 = 24

Case Study 1, HW2 *Missing Numbers*

1. Copy these and then fill in the boxes.

$\square + \square = 19$	$\square + \square = 19$	$\square + \square = 19$
$\square + \square = 27$	$\square + \square = 27$	$\square + \square = 27$

2. Copy these and then fill in the boxes. Notice the different totals.

$\square + \square = 11$	$\square + \square = 17$	$\square + \square = 21$
$\square + \square = 24$	$\square + \square = 26$	$\square + \square = 29$

3. Copy these and then fill in the boxes by finding two **odd** numbers that give a total of 16.

(a) $\square + \square = 16$ (b) $\square + \square = 16$

(c) $\square + \square = 16$ (d) $\square + \square = 16$

4. Copy these and then fill in the boxes by finding two **even** numbers that give a total of 14.

(a) $\square + \square = 14$ (b) $\square + \square = 14$

(c) $\square + \square = 14$ (d) $\square + \square = 14$

5. Copy these and then fill in the boxes by writing in the missing numbers in the shapes.

(a) $\square + 9 = 17$ (b) $\bigcirc + 12 = 19$

(c) $15 + \square = 21$ (d) $\square + 18 = 24$

(e) $\bigcirc + 14 = 25$ (f) $\bigcirc + 17 = 28$

Case Study 1, WS3.1 *Play the Game*

You will need to use sheet CR1

1. (a) You throw a 3 and a 2. Move the counter to the correct position on the board.
   (b) If you move four squares you will get to the bottom of the next ladder.
   (c) Write down the pairs of numbers that you could throw, e.g. 3 and 1.
   (d) Now write these as a sum, e.g. 3 + 1 = 4.

2. (a) You actually throw 2 and a 6. Move the counter.
   (b) How many squares do you need to move to get to the bottom of the next ladder?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

3. (a) You actually throw two sixes. Move the counter.
   (b) How many squares do you need to move to get to the top of the next snake?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

4. (a) You actually throw a 5 and a 6. Move the counter.
   (b) How many squares do you need to move to get to the bottom of the next ladder?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

5. (a) You actually throw a 3 and a 4. Move the counter.
   (b) How many squares do you need to move to get to the bottom of the next ladder?
   (c) Can you get this score on the two dice?

6. (a) You now throw a 3 and a 5. Move the counter.
   (b) How many squares do you need to move to get to the bottom of the next ladder?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

Case Study 1, WS3.2 *Play the Game*

7. (a) You actually throw 4 and 1. Move the counter.
   (b) How many squares do you need to move to get to the top of the next snake?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

8. (a) You actually throw two ones. Move the counter.
   (b) How many squares do you need to move to get to the top of the board?

9. (a) You now throw two fives. Move the counter.
   (b) How many squares do you need to move to get to the bottom of the next ladder?
   (c) Write down the pairs of numbers that you could throw.
   (d) Now write these as a sum.

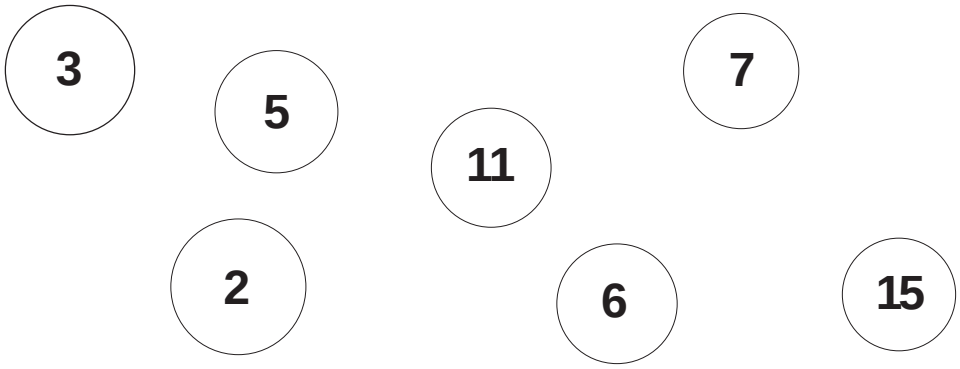
10. (a) You actually throw 2 and a six. Move the counter.
    (b) How many squares do you need to move to get to the top of the next snake?
    (c) Write down the pairs of numbers that you could throw.
    (d) Now write these as a sum.

11. (a) You actually throw a 4 and a 5. Move the counter.
    (b) How many squares will you need to move to get to the 100 square?
    (c) Write down the pairs of numbers that you could throw.
    (d) Now write these as a sum.

12. (a) You actually throw a 6 and a 3. Where are you now?

Case Study 1, Test 1

1.



(a) How many circles are there?

(b) Write the numbers in order starting with the **lowest**.

....

2. Fill in the missing numbers.

(a) ..... + 3 = 9

(b) ..... + 7 = 16

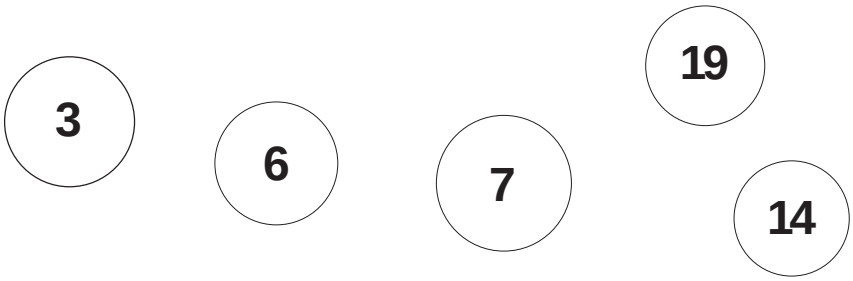
(c) ..... + 5 = 21

(d) ..... + 17 = 28

(e) 12 + ... = 23

Case Study 1, Test 1

3.



(a) Which of these are even numbers? .....

(b) Which two of these numbers add up to 13? ..... and .....

(c) Which two of these numbers differ by 4? ..... and .....

(d) Which two of these numbers add up to 17? ..... and .....

(e) Which two of these numbers differ by 7? ..... and .....

4. On the two dice that you used for *Snakes and Ladders* what numbers would you need to score a total of 8? The first one is done for you.

Dice A	*Dice B*
2	6